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THE MOULTS AND PLUMAGES OF THE SCOTERS,—GENUS OIDEMIA.

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Plates XXIV–XXX.

THE Scoters are a group of sea-ducks best known when adult by their black plumage and bright colored, bulging bills. They are widely distributed during the breeding season in the arctic and sub-arctic portions of the Northern Hemisphere and move southward in the winter to temperate latitudes where they are found in great numbers. Three species, *nigra fusca*, and *carbo*, are peculiar to the Old World, and three, *americana*, *perspicillata* and *deglandi* are found in the New, where along our Atlantic coast they are popularly known to many of our gunners as "Coots."

Historically considered the Scoters are of respectable antiquity, for the very early writers on birds have had something to say about them. In 1555, Belon (L'Hist. Nat. Oyseaux) seems to refer to a sea-duck, and in 1560, Gesner (Icon. Animal., p. 76) mentions "*Anas fera fusca*" but at best fourteenth century descriptions are too vague and imperfect to make much out of them. In 1634, however, Aldrovand (Ornith., iii, p. 234) not only describes the common European species *fusca* under the title "De anate nigra, rostro nigro, rubro & luteo" but also inserts a strange-looking wood-cut of the duck with the white wing band and eye-crescent

most conspicuous. In 1650–1653, Jonston (Nat. Hist. Avium, p. 98) mentions this bird which he figures on plate 49 with a white wing band, calling it "*Anas fusca fera*," but the first author recognizing two species seems to have been Willughby (Ornithol. 1676). At p. 363 he proposes the name "Velvet-Duck" for "Aldrovandus his black Duck," reproducing the latter's wood-cut on plate LXX, and calling the bird "*Anas niger major.*" He describes a second species at p. 280 which he calls "*Anas niger minor*," figuring it on plate LXXIV, and this is evidently what is known as *nigra* today. In 1713, Ray (Synop. Avium, p. 141) describes "*Anas niger*" (= *fusca*) and "*Anas niger minor*" (= *nigra*) and in 1746 Linnæus (Fauna Suecica, p. 38, Nos. 106, 107) describes "*Anas fusca*" and what seems to be an immature *nigra*, but like most of the old writers much is made of the unimportant characters which are shared by many birds, and the real differences are completely missed. This failing, however, I am sorry to say is not confined entirely to the pioneers in ornithology.

In 1750, Edwards (Nat. Hist. Birds, iii, p. 155) describes the "Great Black Duck from Hudson's Bay" which his colored plate — the first of any Scoter — shows is *perspicillata*, and in 1758 Linnæus (Syst. Nat. i, pp. 123 and 125) gives the names "*Anas fusca*," "*Anas nigra*" and "*Anas perspicillata*" to the three species that retain his specific names to this day. In 1760, Brisson (Ornithologie, vi, pp. 420–427) describes at considerable length the three species as "*Anas nigra*" (= *nigra*), "*Anas nigra major*" (= *fusca*) and "*Anas nigra major Freti Hudsonis*" (= *perspicillata*) and many later writers might be cited. It would be out of place to review their statements in this brief sketch for a volume could be filled correcting and explaining the many blunders that have been made. My chief object is rather to clear up such obscurity as still remains. It may be of interest, however, to call attention to the fact that the two American species of Scoters were long confused, *americana* with the European *nigra* and *deglandi* with *fusca*, and not until 1831 did Swainson and Richardson (Faun. Bor. Amer., ii, p. 450) recognize *americana* as distinct, while it was 1850 when Bonaparte (Rev. Crit. Orn. Europe, p. 108) separated *deglandi*. Finally, *carbo* was recognized as a full species in 1887 by Ridgway (Man. N. Am. Birds, p. 112) under the name *stejnegeri*. There are therefore in all

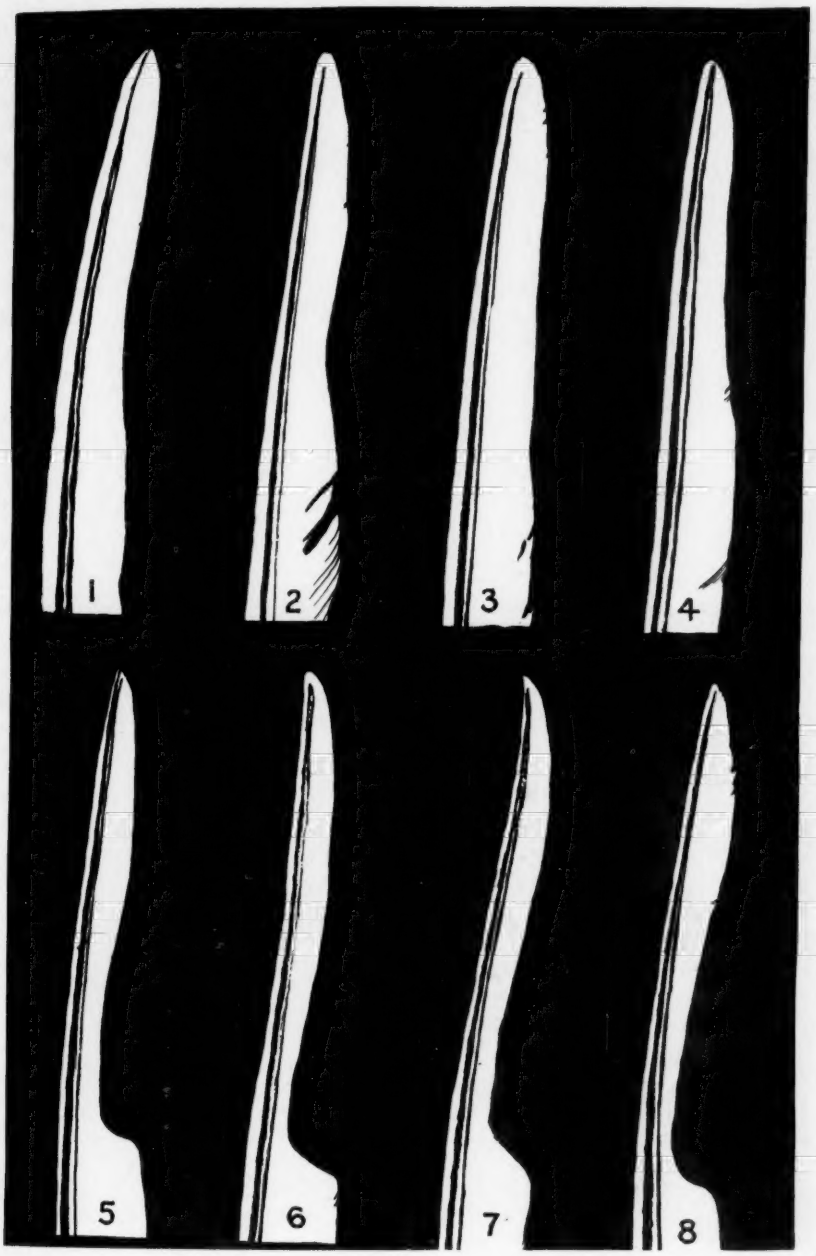
six species in the genus *Oidemia*, the heads of which (Plate XXIV) have been drawn and colored true to life and in most cases from fresh birds by Mr. Henry Thurston. The feathering of the bills is diagnostic of each in all plumages.

The question of genera need not detain us long. I am not one who believes in making generic distinctions so fine that nothing is left except monotypic groups and it seems to me that there should be some difference between a genus and a species. Unless we recognize the six species now in *Oidemia* as congeneric, there should be six genera. Fleming (Philos. of Zool., ii, p. 260, 1822) established the genus *Oidemia* (later spelled *Œdemia*) and although five other genera have since then had more or less vogue, there seems no good reason for recognizing any of them.

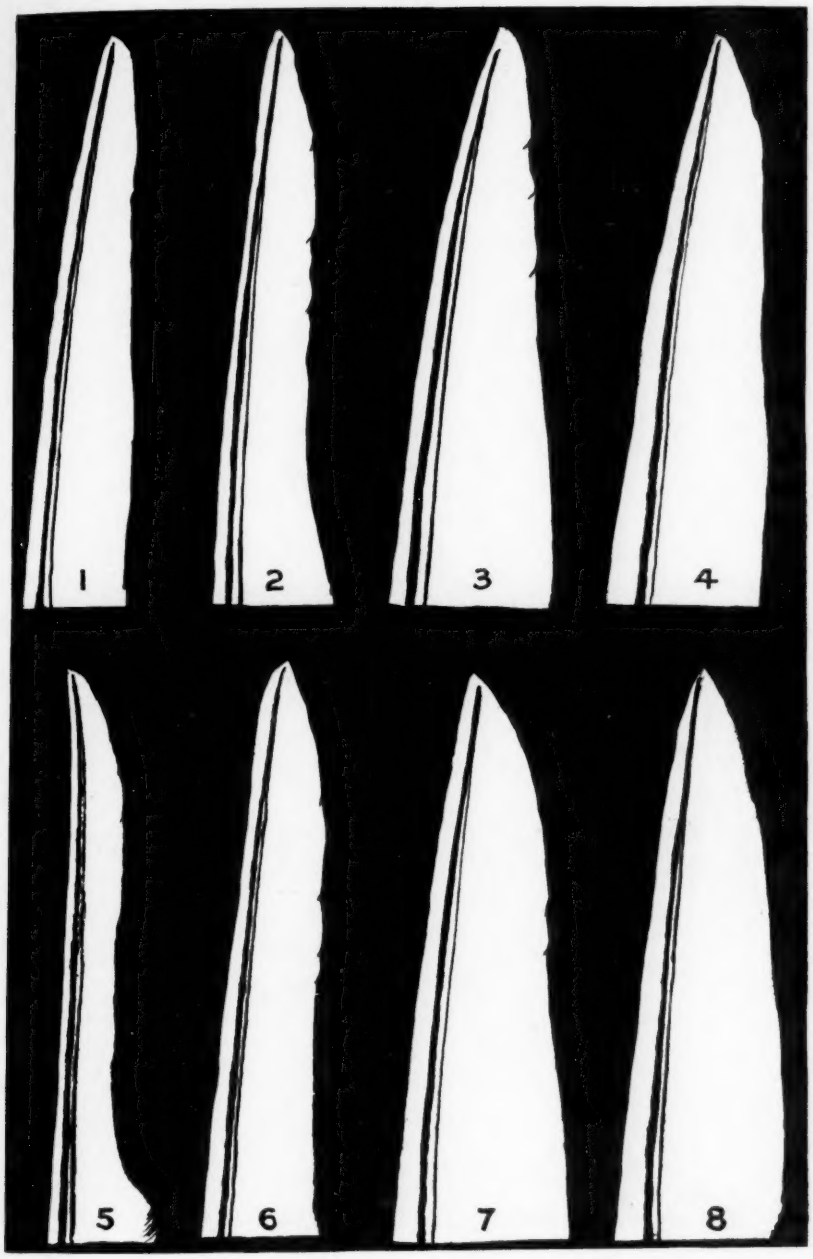
In view of all that has been written about the Scoters during the many years that they have been known to ornithologists, it would seem superfluous to add to a literature that already seems replete were it not that very little has been published bearing directly upon the moult itself and the way that it is related to plumages. Over a dozen years ago I took up the study of the moult of the Scoters making use of specimens that were freshly killed. In this way it has been possible for me to follow the plumage changes much more accurately than merely with dried skins and now with the large series at hand that were first so studied, I am prepared to show some new facts and correlate a good many others that have been imperfectly understood. My own collection includes the following specimens, viz. *Oidemia americana*, 18 adult males, 6 adult females, 10 young males and 3 young females; *O. perspicillata*, 23 adult males, 6 adult females, 21 young males and 10 young females; *O. deglandi*, 23 adult males, 9 adult females, 10 young males and 22 adult females; *O. carbo*, 2 adult males; *O. fusca*, 3 adult males; and *O. nigra*, 3 adult males, 1 young female, and 1 downy young. The bulk of my specimens came from Long Island, New York, but besides my own birds I have examined fully as many others in other private and public collections kindly placed at my disposal. As a consequence I have had no dearth of material except perhaps of breeding birds, and have been able to piece out very complete series of most of the species, representing every month in the year.

The question is sometimes asked: How may the age of ducks be determined? There are several ways of approximating this in wild birds. Of course young birds show several skeletal characters that persist for many months, but the plumage — once it is known — gives us the clue that lasts the longest. It is singular that none of our American authorities since Nuttall in 1834 has ever made mention of the important emarginate first, or distal primary of adult males of *americana*, nor have foreign writers on the moult of *nigra* recognized its value. The like feather in young birds of this species is of quite a different shape, a fact of importance because, until a bird is a year old, the primary marks him as a young bird no matter what sort of plumage he may assume. For the reason that neither this nor the other primaries in ducks are moulted more than once in a year this one feather is a key to the many so called "immature" plumages. I have illustrated (Plate XXV) the differences between the tapering feather tip in young males (Figs. 1–4) and the cut or emarginate tip in adults (Figs. 5–8). The same condition prevails in the European species *nigra* as shown by Plate XXVI (Figs. 1 and 5) where, for comparison, I have also placed male *perspicillata* (Figs. 2 and 6), *deglandi* (Figs. 3 and 7), and *fusca* (Figs. 4 and 8) young and old. I have also added Plate XXVII making a similar comparison between young and adult females of *americana* (Figs. 1 and 5), *deglandi* (Figs. 2 and 6), *fusca* (Figs. 3 and 7) and *perspicillata* (Figs. 4 and 8). This method, which consists of holding the feather over blue-print paper, might be called an avian Bertillon system with wing tips instead of fingers for identification, and I feel confident that it may hold some future possibilities. While a great variation is here shown by the wing prints it should be noted that even where the differences between the young and the adult bird overlap, there is a tendency for the adults of the Scoters to have larger, wider feathers, with the exception of *americana* and *nigra* which alone have the singular cut or emarginate primary in the adult.

As the moults of all the Scoters of the New World, and probably those of the Old are the same and the sequence of plumages identical, a better understanding of them may be obtained by taking them up in natural sequence. The growth of new feathers always begins at definite points, just as it does in other birds, and extends

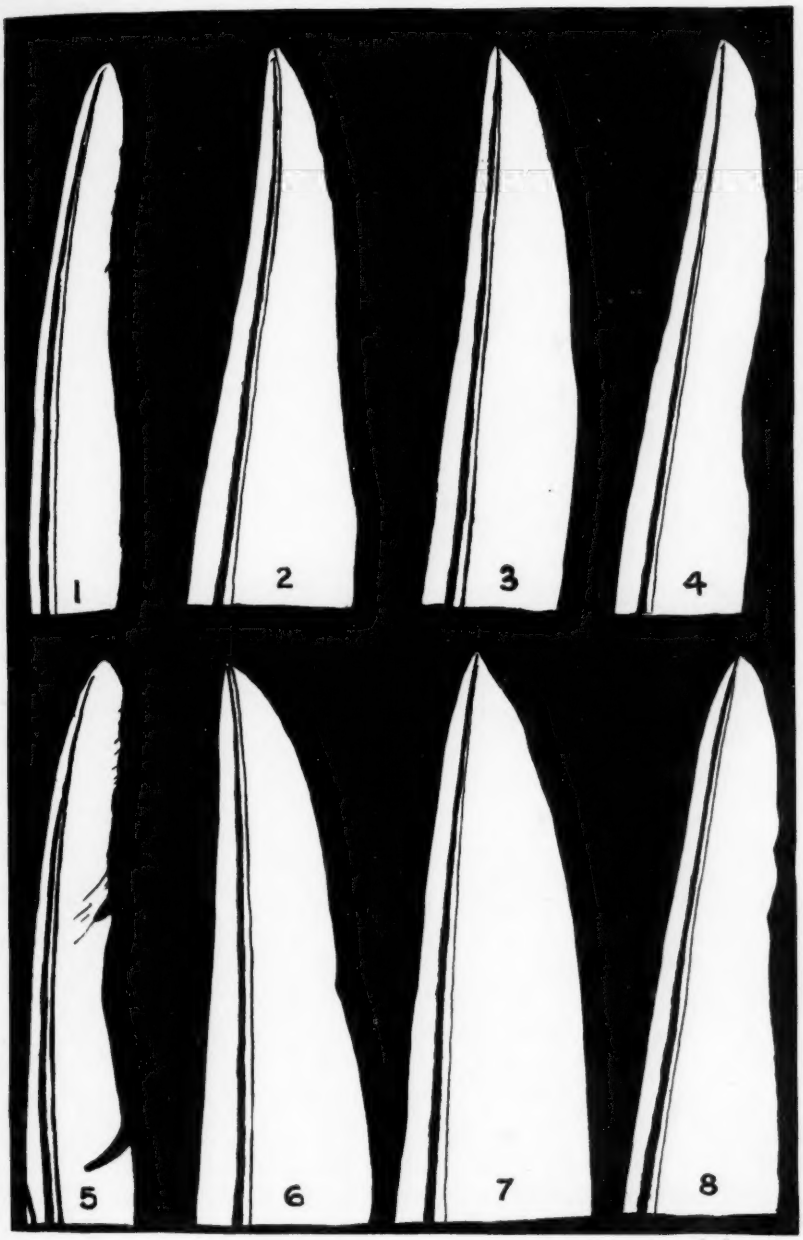


DISTAL PRIMARIES OF OIDEMIA AMERICANA.
Young males, Figs. 1–4. Adult males, Figs. 5–8.



DISTAL PRIMARIES OF MALES.

Oidemia nigra,	young male,	Fig. 1;	adult,	Fig. 5.
" *perspicillata*,	" "	Fig. 2;	"	Fig. 6.
" *deglandi*,	" "	Fig. 3;	"	Fig. 7.
" *fusca*,	" "	Fig. 4;	"	Fig. 8.



DISTAL PRIMARIES OF FEMALES.

Oidemia	*americana*,	young	female,	Fig. 1;	adult,	Fig. 5.
"	*deglandi*,	"	"	Fig. 2;	"	Fig. 6.
"	*fusca*,	"	"	Fig. 3;	"	Fig. 7.
"	*perspicillata*,	"	"	Fig. 4;	"	Fig. 8.

along definite paths. This shows clearly in the Scoters where the black feathers of the head begin to show chiefly anteriorly and the moult moves slowly backward, leaving a gap on the neck before it joins the spot on the breast and back where a similar backward movement has been in progress (Plate XXVIII, Fig. 2; XXIX, Fig. 2; and XXX, Fig. 2). Feather growth next extends along the sides and flanks and the last area to be affected by a moult is the middle part of the abdomen (Plate XXVIII, Fig. 3; XXIX, Fig. 3; and XXX, Fig. 3), although in the downy chick this area is clothed before the wing-quills sprout.

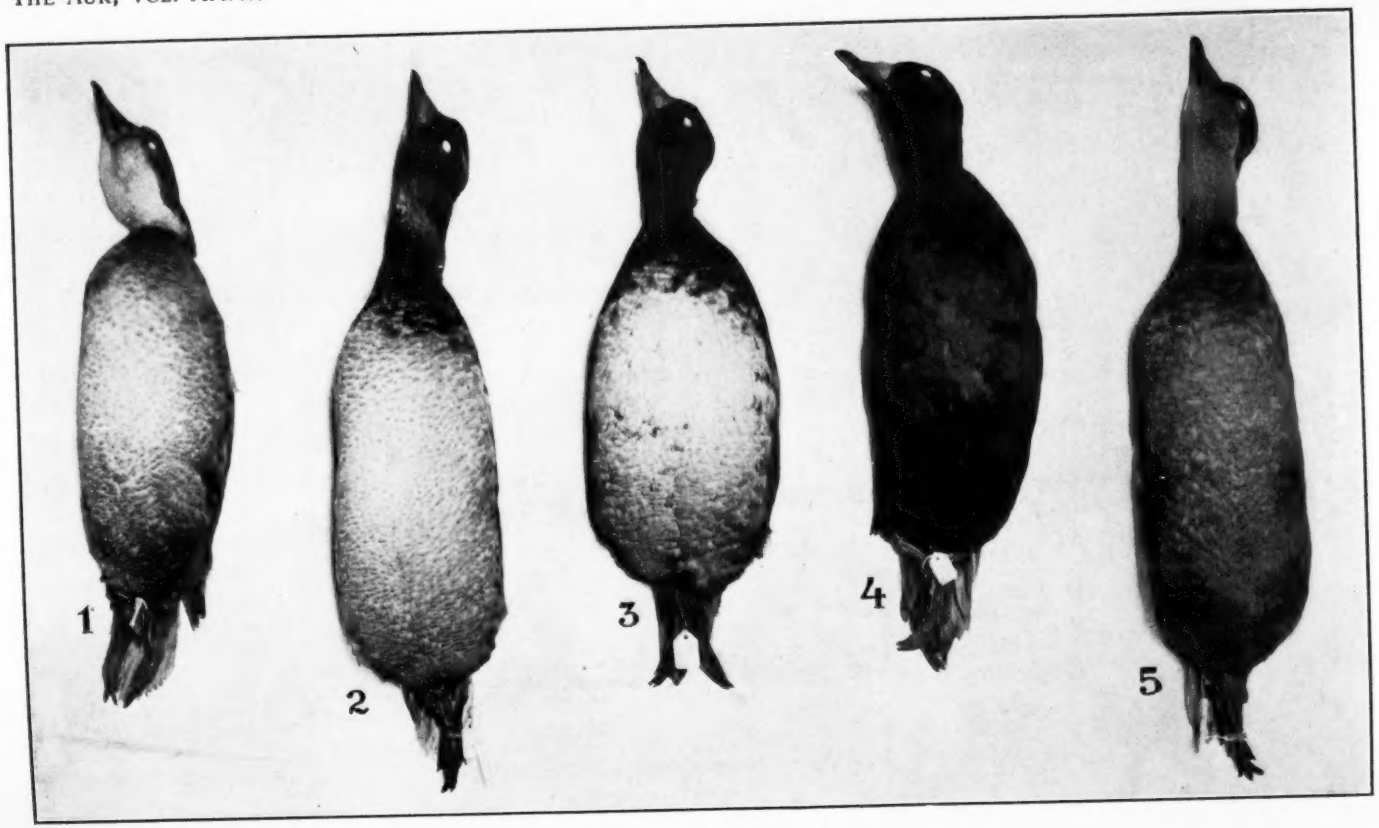
There is no haphazard growth. Moult may be delayed, especially in females, or it may be checked in some young birds before it has extended as far as it does in others, but birds of the same age have approximately the same plumages. The difficulty has always been to classify plumages and moults by name, and this is particularly difficult in the Scoters because there is no month in the whole year when some individuals may not be found moulting. Especially is this true of young birds arriving from the northern breeding grounds, in full juvenal plumage, some showing the growth of a few winter plumage feathers in October and others being no farther advanced in March. Furthermore some males have become largely black by January while others are at a similar stage in April, so that young birds may be found in active moult throughout the entire winter. Specimens examined when freshly-killed show many pin feathers that easily escape notice in skins and I am convinced that there are two moults concerned in the changes of the first winter, a partial postjuvenal and a partial prenuptial. Both produce black feathers in the male and brown ones in the female, but where one leaves off and the other begins it is impossible to say. As we find new black feathers among old black ones we may assume such birds have undergone two moults, but as a rule we find new black among brown feathers only which indicates the postjuvenal moult and the growth of first winter feathers. When such growth occurs in spring birds however it seems rather absurd to call them first winter feathers rather than first nuptial, but we must either do this, consider the first winter plumage suppressed in some individuals, or consider the postjuvenal moult as aborted and its place taken by the prenuptial. It is merely a question of what

is the best way of expressing facts and as the stages of moult and of plumage overlap and it is simplest to draw an arbitrary line somewhere.

During the first winter, the knobs and bulgings of the bills of males gradually appear as well as the colors that are peculiar to them and to the legs and feet. The iris, brown in all females, in all young birds of both sexes and in the adults of *americana* and *nigra*, in males becomes pale yellow during the winter and by the end of the year white in *deglandi*, *carbo*, *fusca* and *perspicillata*. After the complete first postnuptial moult in August, young birds are scarcely distinguishable from adults, although in some the plumage is not so black and the bills are less bulged. From now on adults, both male and female, not only have a complete postnuptial moult each August or September, when through simultaneous loss of all the wing-quills, they lose the power of flight, but they also undergo a partial prenuptial moult in March and April which involves the body plumage and the tail, never the remiges of the wings. I have yet to see an adult bird of any of the species taken in the spring which is not in active moult, and that this stage of moult should have been completely overlooked is a matter that may well surprise us. I do not find evidence of any eclipse plumage in the Scoters as is claimed by a recent writer, a point to be discussed later. With these preliminary remarks which apply indiscriminately to any of the Scoters, we may take up each species in turn and show the development of its plumages and moults. I cite by number only such specimens as seem worthy of special notice in order to fix a day or to emphasize a fact.

Oidemia americana.

Natal Down. The only specimen examined (Am. Mus. No. 76845, Gichiga, N. E. Siberia, Aug. 17) is one about half grown and it already has acquired some of the juvenal plumage. The bird seems to be indistinguishable from a younger specimen of *nigra* (J. D., Jr. No. 30919, July 30) from Norway. It is dark brown above and lighter below, an indistinct collar separating the breast from the still whiter chin and throat; a dark brown cap is indistinctly outlined foreshadowing that of the next plumage. The



OIDEMIA AMERICANA.

Fig. 1. Juvenal plumage, male and female. Figs. 2 and 3. Juvenal plumage plus first winter, male.
Fig. 4. Adult male. Fig. 5. Adult female.

wing-quills are just showing with the down still adherent at their apices. The tail is grown and much worn illustrating the fact that in the duck, a water fowl, the tail develops earlier than do the flight feathers which is contrary to the order of moult in land birds. The scapulars and breast feathers are partly grown.

Juvenal Plumage (Plate XXVIII, Fig. 1), acquired by a complete post natal moult, and in this dress the sexes are alike although females average a little smaller in most of their measurements. It is unsafe without dissection to attempt to distinguish the sexes until feathers of the first winter plumage begin to appear together with the later changes in the color and form of the bill in the male. Young males arriving from the north in October (J. D., Jr., No. 9798, Oct. 26) and in early November (J. D., Jr., No. 4716, Nov. 8) soon begin to show a scattered growth of black feathers and later the females show brown feathers but the juvenal dress may be worn in some cases for several months before the postjuvenal moult sets in. A spring female (J. D., Jr., No. 4867, March 4), for example, is wholly in juvenal plumage with merely a few new feathers begining to appear. *O. nigra* and *americana* are practically alike in this plumage, being brown above with a dark cap and lighter below, but the bill of *nigra* is rather heavier; *deglandi, carbo, fusca* and *perspicillata* are brown above, lighter below and show two large white spots on the side of the head, and *deglandi, carbo,* and *fusca* have white wing patches.

1st Winter Plumage (Plate XXVIII, Figs. 2 and 3), acquired by a partial postjuvenal moult which never includes the wings and seldom the lower surface of the body. At most the head, neck, back and sides become black in males and a much less extensive growth of brown feathers occurring relatively later takes place in females. The tail too is moulted, the rectrices showing irregularities in their replacement. The moult probably progresses slowly but it must be remembered that in the winter while we see individuals in all stages no doubt they begin to moult at widely different dates and it is impossible to say just how long any one bird has been actually moulting. I am convinced that males which are well advanced by January, also undergo a prenuptial moult in April or May, like adults, but it is difficult to tell whether the specimens which are moulting at this late period are undergoing a much

delayed postjuvenal or a distinct prenuptial moult. The results are the same so far as the plumage is concerned, the new feathers being black in each case, but, if there be a prenuptial moult, three different generations of feathers can be found while as a rule only two are demonstrable. The most developed specimen I have seen (J. D., Jr., No. 4412,♂, April 20), is almost wholly black except the wings and a few scattered brown feathers on the abdomen and the back, but we have no means of knowing how many birds reach this advanced stage — probably very few. The abdomen, as a rule, becomes darker anteriorly and posteriorly as the feather edgings are narrower here and sooner show the dark basal part as they wear off and the fading is considerable.

Shortly after new feathers appear, the bill of the young male begins to take on the colors of the adult and still more gradually assumes its shape. The colors may closely approximate, by the end of the winter, those of the adult, but the shape is not perfected for at least a year, the swelling of the hump not being marked in the first winter birds although the yellow color may be brilliant. The bill of the female and the legs and feet of the male remain dusky, adults differing very little from young birds.

No matter how black the plumage may be nor how bright the colors of bill or feet, young males may infallibly be told from adults by the shape of the first primary (Plate XXV) which is not replaced until the first postnuptial moult. The iris in *americana* is always brown in both sexes at all ages.

1st Nuptial Plumage. This is either the first winter plumage plus more or less wear, being therefore a mixture of much worn juvenal and less worn first winter feathers, or it is, in part, the result of a first prenuptial moult. It is pretty well established from observations on birds in captivity that no ducks breed until their second year.

2d Winter Plumage, acquired by a complete first postnuptial moult. It is probable that this moult begins in July, but a lack of specimens prevents me from giving exact dates. A specimen of Dr. L. B. Bishop's (No. 557, August 28) is a male that has nearly completed this moult and acquired the emarginate primary. There are enough worn brown juvenal feathers remaining to show that the bird never had assumed much of the first winter dress. As a

rule the moult is almost completed when the birds reach our latitude. At this time the characteristic emarginate distal primary is assumed replacing the uncut juvenal feather (Plate XXV) and the yellow hump of the bill has in some cases reached full development. The plumage is now wholly black. As early as October 26 (J. D., Jr., No. 9796) I have seen a specimen that had ceased to show any signs of moult while others as late as November 12 (J. D., Jr., No. 11983) still show a few pin feathers growing on several of the feather tracts. There is a difference in the intensity of the black in fall specimens and we may suppose the blackest are birds several years old although it is probable that individual variation is the real factor. At all events, the duller birds are the ones that in the course of the winter show the most wear and become more or less brown in the second spring. It may be noted that the growth of the hump of the bill tilts the nostril from the more horizontal position it has in the young male. The nostrils of *deglandi* and *perspicillata* being wholly within the zone of the uplift do not lose their relative positions.

2d Nuptial Plumage (and all later nuptial plumages) acquired by a partial prenuptial moult involving the body feathers and the tail. Contrary to general opinion an extensive moult takes place at this period in both sexes. No birds of many examined in March and April fail to show abundant growth of new feathers. As these, however, are black like the old ones they replace, no change in the appearance of birds is affected save that the plumages look fresh and new.

3d Winter plumage (and all later winter plumages) (Plate XXVIII, Fig. 4, ♂; Fig. 5, ♀) acquired by a complete second postnuptial moult. Differs only from the first postnuptial plumage in that a black emarginate primary replaces a similar one instead of replacing a plain brown juvenal feather as at the first postnuptial moult. A large part of the variation in intensity of color in plumage, bills and feet is probably in consequence of some adults being only one year old while others are two or more. The adult female is uniformly dark brown above and below, whereas the juvenal female is much lighter below and shows a more distinct cap.

Oidemia perspicillata.

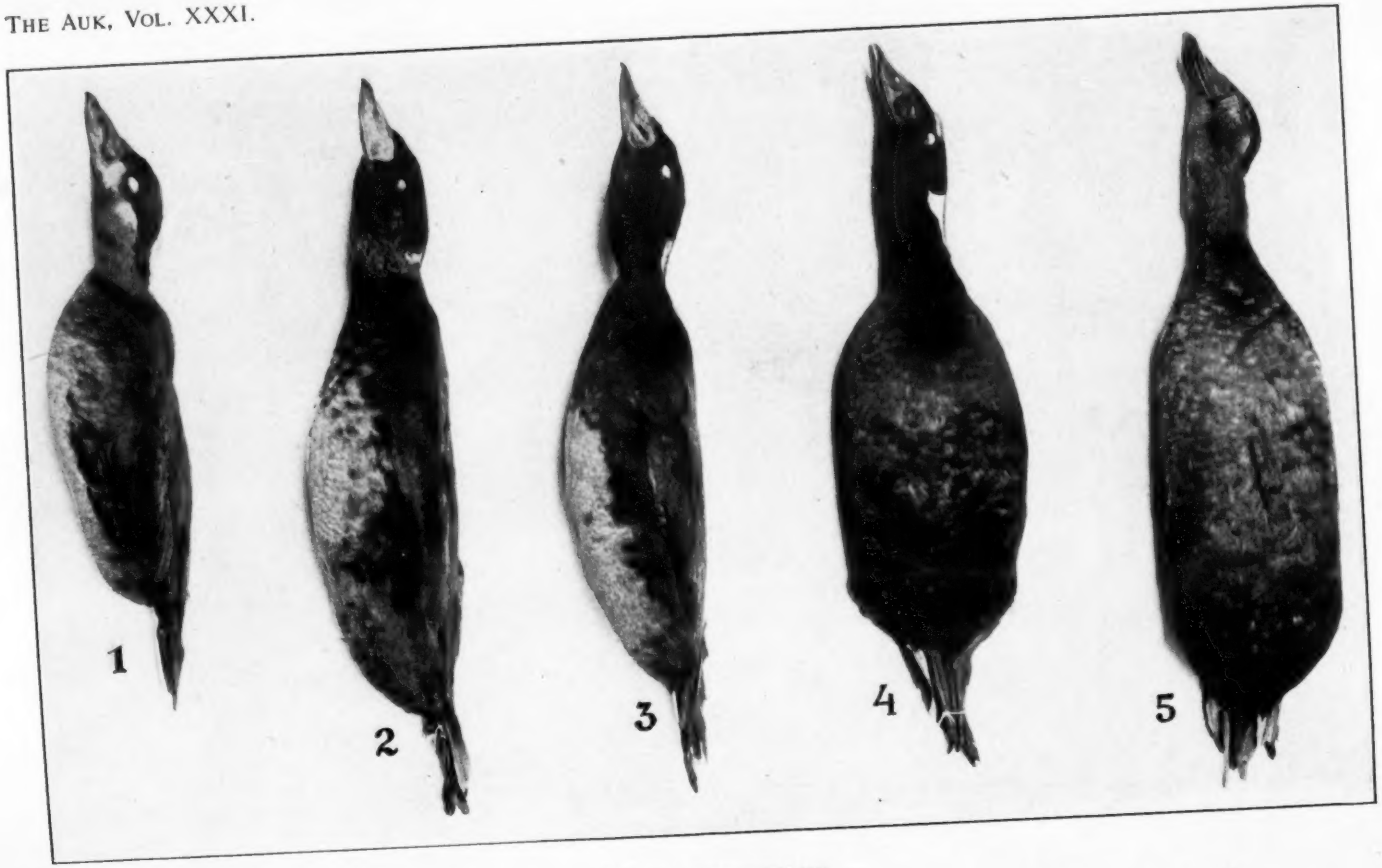
Natal Down. I know of no specimen in collections.

Juvenal Plumage (Plate XXIX, Fig. 1) acquired by a complete postnatal moult. Females are a little smaller, but in plumage the sexes are alike, the color being brown with two conspicuous white patches or rounded spots on the side of the head. These vary in size, sometimes nearly merging; the anterior is whiter and smaller, and the posterior is also smaller than in *deglandi* and they tend to become whiter with wear and fading. The absence of white on the wing separates this species from *deglandi*, *carbo* and *fusca* and the feathering of the bill is, of course, diagnostic. Birds in this plumage much worn may be found late in the winter but as a rule the growth of the first winter dress begins in October rather earlier than in *americana*.

1st Winter Plumage. (Plate XXIX, Figs. 2 and 3) acquired by a partial postjuvenal moult the extent of which is variable. A few black feathers at the corners of the mouth, along the margin of the bill, and on the interramal space may begin to show by early October (J. D., Jr., No. 34151, ♂, Oct. 2).

I have some specimens that are as far advanced in December (J. D., Jr., No. 8045 ♂, Dec. 6) as others are in March (J. D., Jr., No. 7419 ♂, March 17) or even April, such birds having the head, neck, fore-part of the body, the sides, scapular region and rump black and a single white nuchal patch. Females are more backward and more limited in their moult and the new feathers are brown instead of black. The tail is renewed during the first winter and colors come gradually into the bill and feet of males. The change in the shape of the bill is slower, a wrinkling of the black bosses being the earliest sign, but the winter has gone before bills and feet can be mistaken for those of the adult. The iris is brown in young males, becoming yellow and finally white when the bird is about a year old.

It is of interest that young males acquire only the posterior or nuchal, of the two triangular white areas that mark the head of the adult. The area where the frontal patch is developed in the old male is covered by black feathers in the young bird. The two juve-



OIDEMIA PERSPICILLATA.

Fig. 1. Juvenal plumage, male and female. Figs. 2 and 3. Juvenal plumage plus first winter, male.
Fig. 4. Adult male. Fig. 5. Adult female.

nal white spots on the side of the head are completely obliterated by black feathers as the postjuvenal moult progresses and the fresh white nuchal patch becomes more or less prominent varying individually greatly in extent and purity of color.

1st Nuptial Plumage. Practically the same as the first winter with wear added which creates greater havoc among the brown juvenal, than among the black first winter feathers. In some birds, perhaps many, there is a prenuptial moult which adds black feathers to those already grown or replaces them. Yearling birds do not breed and are late in beginning the postnuptial moult. A specimen (J. D., Jr., No. 4367) taken September 4 well illustrates wear as well as the delayed postnuptial moult in immature birds, for the brown feathers of wings, tail, lower parts and back are the worn and faded juvenal feathers, the black ones of head, neck, breast, and sides are of first winter (or perhaps first nuptial) while here and there a few black feathers of the second winter plumage are just beginning to appear. It might well be November before such a bird as this would complete his moult.

I find no evidence of an "eclipse" plumage as is claimed but can understand how retained brown and worn feathers of an earlier plumage could be mistaken for an "eclipse" growth.

2d Winter Plumage, acquired by a complete first postnuptial moult, at which the adult plumage is assumed. The male now has two white triangles on the head and the colored bulging bill, and the female assumes a plumage much darker than in the first winter. She loses to a large extent the two juvenal white spots on the side of the head for which are substituted an obscure anterior and a more conspicuous posterior whitish spot, both of them obscured by the dusky feather tips which later are worn off. The female too has an indistinct cap which is blacker than in *deglandi* and she may or may not have an indistinct white nuchal patch similar to the male,— the individual variation is considerable.

2d Nuptial Plumage (and all later nuptial plumages) acquired partly by wear, mostly by a partial prenuptial moult confined chiefly to the head and sides. Many birds examined in March and April show the growth of new black feathers among the old. A specimen (Amer. Mus. No. 102082) of May 19 still shows new growth giving the abdomen a mottled look and the sides a blacker tint.

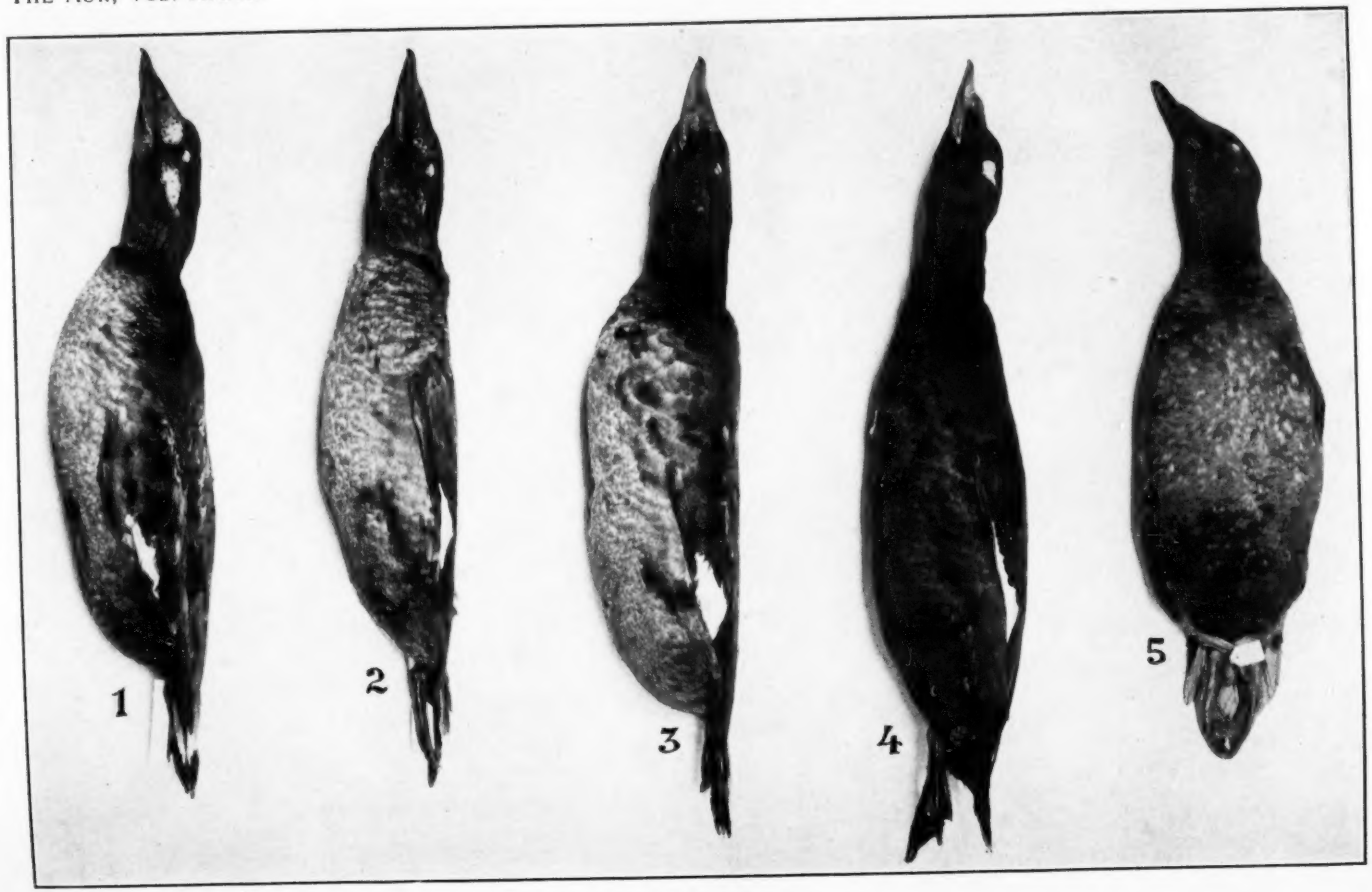
3d Winter Plumage (and all later winter plumages) (Plate XXIX, Fig. 4 ♂, Fig. 5 ♀) acquired by a complete second postnuptial moult. A specimen (Am. Mus. No. 90694 ♂, July 28) has moulted the body plumage, but still retains the wings and tail, another (Am. Mus. No. 119177 ♂, Aug. 4) is at about the same stage and still another (No. 7151 ♂, Sept. 1) is at the flightless stage having shed the wing quills. Still another (Am. Mus. No. 76208 ♂, Aug. 24) is the most advanced and has new flight-feathers, tail and body feathers mostly grown. The less highly developed bills and the browner plumage of some birds may or may not indicate less mature birds, but on account of individual variation it is impossible to guess the age of such specimens with any certainty, after they lose the last of the juvenal feathers. We must know the age of the feathers if we wish to know the age of the bird.

Oidemia deglandi.

Natal Down. Dusky brown above and dull white below, whitish under the eye and a white patch of down foreshadowing the white wing patch.

Juvenal Plumage (Plate XXX, Fig. 1) acquired by a complete postnatal moult. The white speculum distinguishes this species from all the Scoters except *fusca* and *carbo* which it closely resembles in this plumage. The light patches on the sides of the head are as a rule rather larger than those of *perspicillata* and are often of a dingier white. The posterior spot is the larger of the two and the anterior is apt to be brownish towards the bill. There is much variation, the light area often extending to the forehead and sometimes almost coalescing with the posterior spot. The feathering of the bill is diagnostic. Birds wholly in this plumage may be found from October (J. D., Jr., No. 474, ♀, Oct. 21) to April (J. D., Jr., No. 34134 ♀, April 18).

1st Winter Plumage (Plate XXX, Figs. 2 and 3) acquired by a partial postjuvenal moult, more or less of the brown body plumage being replaced by black feathers in the male, brown in the female; the white head patches are obliterated in the male, merely dulled in the female. A band of dark brown feathers develops in males along the sides and flanks, but it is less conspicuous than in the



OIDEMIA DEGLANDI.

Fig. 1. Juvenal plumage, male and female. Figs. 2 and 3. Juvenal plumage plus first winter, male.
Fig. 4. Adult male. Fig. 5. Adult female.

adult. The color of the bill soon approximates that of the adult but the upward swelling of the culmen seems to require a year or more for its full development, as indicated by specimens that are adult in plumage. The white of the secondaries is not so extensive as it is in adults, but this is a variable character.

It is worthy of careful note that no white crescent below and behind the eye develops until the first postnuptial moult. The little feathers of the lower eyelid, brown in the other species, in this one are dingy white in the juvenal dress and fade whiter, and when the new feathers of the first winter grow they are either a dingy white or more often tipped with brown or black which is lost as the tips wear off, but no white feathers grow during the first winter on the area where the white crescent of the adult is found.

1st Nuptial Plumage. Practically the same as the first winter plus wear or with a partial prenuptial moult and therefore chiefly a mixture of juvenal and first winter feathers, and sometimes those added by the prenuptial moult.

2d Winter Plumage acquired by a complete postnuptial moult. Adult characters are now assumed except that the bill has less of a "hump" than in older birds, but there is doubtless great individual variation. The brown band along the sides is now conspicuous and wears and fades because of its color more than do the black feathers of adjacent parts. In *fusca* and *carbo*, however, this band is as black as the breast and abdomen adjacent. A bird belated in moult (Am. Mus. No. 115554, September 17), has new wings and tail, but still retains brown juvenal feathers below and on the back, while about the head and elsewhere are scattered many brown greatly worn feathers; the white spot below the eye is small, the bill is sloping but its color is bright.

In the adult female the obliteration of the white spots of the side of the head is much more complete than in *perspicillata* and the feathers that grow upon them are basally whiter and often merely tipped with black especially those of the posterior spot.

2d Nuptial Plumage acquired by a partial prenuptial moult as shown by many specimens moulting in April and May. As this plumage is the same as the winter the only obvious effect is to freshen up the bird. A specimen (J. D., Jr., No. 8238 ♂) of May 8 shows the brown band much worn with the darker new brown

feathers coming in, while elsewhere black are replacing black and are not obvious unless studied in the fresh bird. A similar specimen was taken May 20 (J. D., Jr., No. 8242) and I have seen several others. Still another (J. D., Jr., No. 29981) of June 26 shows much wear and fading especially on the wing-quills where the pattern of each overlapping primary is impressed on the protected feather beneath. As this bird was perhaps crippled and certainly was one that had not gone north in migration, the late date of feather growth may thus be explained.

3d Winter Plumage (and all later winter plumages) (Plate XXX, Fig. 4, ♂, Fig. 5, ♀) acquired by a complete second postnuptial moult. Birds are now fully adult.

Males with a knob on their bills are probably a year and a half old at least and those with the biggest knobs two years old or more.

The variation in size and in color is very considerable, part of it being due to age and part of it being individual. The depth of color in the plumage, the size of the eye-crescent and of the white area on the wings is also variable.

Adult females are quite sooty and in fresh plumage are devoid of white about the head but as the feather-tips wear away, exposing the white basal portions of the feathers more or less distinct white patches appear on the sides of the head, especially over the site of the posterior juvenal spot. The wear is most marked in breeding specimens. Females do not assume bills with knobs, nor are the bills colored except a band near the nail.

Oidemia carbo.

The plumages and moults of this species seem to correspond to those of *O. deglandi* which it most resembles, but I have seen only eight specimens all told. It differs from *deglandi* in a bill with a concave knob that suggests a battle-ship so marked is the overhanging protuberance, the loral feathering extending farther forward than the frontal, and the latter rounded or flattened instead of extending into an angle. Besides this it is very large and the adult male has black flanks and sides, instead of brown as in *deglandi*, a character which it shares with *fusca*. The feathering of the bill seems to be diagnostic (Plate XXIV, Fig. 6), and its color seems to be richer than in *deglandi*.

Oidemia nigra and **Oidemia fusca.**

It would be folly for me with the limited material I have examined to attempt to follow, as I have done with the three American species, the moults and plumages of these foreign species, but fortunately we may turn for this to J. G. Millais' "British Diving Ducks," 1913. In this splendid work will be found the best accounts yet published of the moulting of certain ducks and I agree with almost all of the views expressed therein regarding Scoters. Still, I regard the term "immature" as too vague to cover the situation satisfactorily and I find no mention is made of the prenuptial moult of adults, nor of the emarginate primary of *nigra*, while the occurrence of an "eclipse" is claimed for *nigra*, *fusca* and even *perspicillata*. I will quote Mr. Millias' own words regarding the "eclipse" in the Velvet-Scoter (*fusca*).

"The most interesting feature, however, is a patch of whitish brown eclipse feathers behind the eye and the bill which had evidently come in in July and give the bird a female appearance. In front of these feathers is a jet black patch which has, however, only been renewed once in the plumage change (July–November). The breast and lower parts are brown and the tail and wings are being renewed. The bird was incapable of flight when I shot it."

His photographic plate of the bird shows a dorsal view with the head turned to one side and without actually having the specimen in hand I must say that the "eclipse" feathers look suspiciously like worn feathers of an earlier plumage and probably were acquired at the prenuptial moult. Such feathers frequently persist on these (and other) areas and I have a specimen of the closely related *deglandi* (Am. Mus. No. 119176 ♂ ad., June 2, Mackenzie River delta) which matches the one in question very nearly, new black, growing among the brownish feathers near the bill. I consider my bird as beginning the postnuptial moult, for the flight feathers and tail are old and there are comparatively few evidences of moult elsewhere. Specimens of *perspicillata* and *americana* show no signs whatever of "eclipse" in July, August or September, although some birds are browner than others about the head, which is merely individual variation. The feathers of *perspicillata*

and *deglandi* on an average are whiter basally than are those of *nigra, fusca* and *americana.*

I find adult specimens showing the prenuptial moult both in *nigra* and *fusca.* An adult of *nigra* (J. D., Jr., No. 14233 ♂ ad. mid-March, near Lübeck) shows new growth well advanced and another *nigra* (Am. Mus., No. 26893 ♂ ad., May 18, Havre) still shows growth of new black feathers among rusty old black ones. An adult specimen of *fusca* (J. D., Jr., No. 24553 ♂ ad., May 5, Norway) shows chiefly rusty black feathers with new ones growing, while in another bird (J. D., Jr., 14234 ♂ ad., June 8, Norway) the growth seems to have ceased. It will be observed that the prenuptial moult in American Scoters runs over in point of time almost if not quite into the postnuptial and I really do not see where an "eclipse" could come in, but I do see how "whitish brown" feathers may well be found behind a fresh patch of "jet black" without invoking the aid of an "eclipse."

It is evident that Mr. Millais is in some doubt about it for he pens the following regarding an "eclipse" in *nigra,* viz.:

> "The principal moult towards maturity commences in July when the bird is one year old. A number of temporary brown feathers, which may be called the first eclipse appear on the head and neck these being again shed in late October." . . .
>
> "Like all the Scoters the local common Scoter has only a slight eclipse plumage if it may be so called. At the end of July a few dull brown feathers appear on the cheeks and neck. Below the lores and on the throat many of these feathers are of a dirty white color and it gives the old male a certain resemblance to a female and for which they have doubtless been mistaken. No author that I can discover mentions having seen this eclipse plumage which is retained to late in the autumn but I have examined two males killed in August in Iceland which exhibit this dress."

It seems to me that the facts have been observed correctly but interpreted wrongly. As I have stated before, the Scoters are moulting practically throughout the whole year and to say where one moult begins and another ends is not an easy matter. I have endeavored to show *when* certain characters of plumage are acquired and that the definite sequence in feather growth furnishes a key to the age of specimens. Unless the age of specimens can be determined very little progress is possible in settling questions of moult and plumage.

1. LOOKOUT MOUNTAIN FROM THE WEST. SHOWING THE GENERAL TOPOGRAPHY OF THE AREA.

2. GENESEE MOUNTAIN FROM THE NORTH. LOCATED AT THE WESTERN EDGE OF THE REGION TREATED.

A LIST OF BIRDS FROM THE VICINITY OF GOLDEN, COLORADO.

BY R. B. ROCKWELL AND ALEX WETMORE.

Plates XXXI–XXXIII.

FORE-WORD.

IN any section of the country, where an appreciable amount of ornithological field work has been done, it is more or less difficult to plan a season's work, which will not conflict with, or duplicate, that already done by others. It was only after some thought, therefore, that the section in eastern Colorado covered in this paper was decided upon, because of its accessibility, and for the results which we hoped to obtain. Here we were enabled to study the conditions found from the plains level to an altitude of 7600 feet, presenting characters of the greatest interest to the naturalist and giving considerable diversity of forms.

GENERAL ACCOUNT OF THE REGION.

The region as a whole which we covered, extended from Turkey Creek Cañon, three miles south of Morrison, to Tucker's Gulch, four miles north of Golden, and reached from the eastern extremity of the Table Mountains at Golden, to a point about seven miles west of Golden. Clear Creek runs through the northern part of the area, coming out of the foothills through a steep, precipitous cañon, and flows eastward between the two Table Mountains, where its gravelly bed occupies a flat valley. These Table Mountains (known respectively as the North and South) are huge, flat-topped buttes, with their sides covered with thickets of plum brush, etc., and their stony tops supporting level expanses of grass with a few alkaline pools, furnishing brackish water.

Bear Creek comes out of another deep cañon at the town of Morrison, and flows through a level valley, sunken perhaps fifty feet below the surrounding plains level. Turkey Creek next to

the south resembles Bear Creek, but the cañon through which it flows while deep and rugged supports more vegetation than either one of the other two.

A peculiar rock formation known as the "Hogback" of which the Table Mountain forms a part, extends approximately north and south parallel to the line of the foothills, making a valley here averaging two miles in width. Golden itself, lies right at the base of the foothills, and has an altitude of 5655 feet, while Clear Creek east of there is perhaps one hundred feet lower. The Table Mountains rise to 6550 feet on the north and 6300 feet on the south, and the foothills go up abruptly to 7600 feet, on the highest point of Lookout Mountain. Along the foothills are numerous gulches winding out of the mountains and of these, Chimney Gulch, immediately west of Golden, affords the readiest access to the higher country. In the lower portions the sides of these gulches were covered with plum brush, ninebark, mountain maple, and other shrubs, while higher up were groves of quaking aspens and pines. South of Chimney Gulch comes Dead Man's Gulch, Coon Gulch and Mount Vernon Cañon, the first two very steep and rocky, and the latter descending to the plains more gradually. Magpie Gulch opens into the north wall of Clear Creek Cañon, and is barren with hardly any trees or shrubs, while Tucker's Gulch north of here, opening on the plains directly, is equally barren and little of interest was found in these two.

This district has (subsequent to the period covered by these notes) taken on added interest through the creation of the "Denver Mountain Parks" which include practically all the territory covered in this list. By means of a special tax levy funds have been made available for the purchase of extensive acreage at various places best adapted for scenic view-points, and at the present time (1913) an extensive system of splendid roadways is being constructed, which when completed will form a network of beautiful driveways making the entire district easily accessible to automobiles and other conveyances. A remarkable "Funicular Railway" operated by electric power which rises to a vertical distance of eleven hundred feet in twenty-seven hundred feet of track from the valley back of Golden to the top of Lookout Mountain is now in operation, and is widely patronized. The city now owns over

one thousand acres of land and the entire "Mountain Park" plan as outlined by the civic expert, Mr. Frederick Law Olmsted contemplates the eventual expenditure of over two million dollars. The "Denver Mountain Parks" bid fair to develop into one of the scenic features of Western America, and it will be interesting indeed to note the effect of this vast campaign of development and improvement upon the future distribution and abundance of bird life within the park district.

DISTRIBUTION AREAS.

The plains area covering all of the low country and extending practically to the base of the foothills and on the warm slopes of the Table Mountains nearly to their summits was characterized by growths of *Helianthus, Opuntia, Atriplex,* a species of *Peritoma,* etc., while broad-leaved cottonwoods grew along the streams and even extended up some of the gulches beyond their mouths. The creek bottoms supported dense growths of wolf berry and other shrubs, forming with the cottonwoods favorable cover for retiring species. Characteristic birds of this region were *Icterus bullocki, Agelaius p. fortis, Carpodacus m. frontalis, Astragalinus p. psaltria, Ammodramus s. bimaculatus, Melospiza m. montana, Passerina amœna, Icteria v. longicauda, Dendroica a. æstiva, Geothlypis t. occidentalis,* and *Dumetella carolinensis.*

In the gulches, lining the bottoms and forming thickets on their steep sides were found various shrubs as *Prunus, Symphoricarpus, Cratægus, Opulaster* and *Acer glabrum.* The Oregon Grape (*Berberis aquifolium*) was abundant, *Amelanchier* sp. and *Heracleum lanatum* less so. The Narrow-leaved Cottonwood (*Populus angustifolia*) grew in Turkey Creek Cañon and in Chimney Gulch were dense growths of Ninebark. *Pipilo m. montanus, Oreospiza chlorura, Vermivora virginiæ,* and *Salpinctes obsoletus* were more common in this intermediate area with many other birds ranging in from above or below.

On the summit of Lookout Mountain (Plate XXXI) occurred growths of *Lepargyrea canadensis, Rubus strigosus, Epilobium, Vaccinium, Alnus, Populus tremuloides* and many others. *Cyano-*

citta s. diademata, Penthestes g. gambeli, Dendragapus o. obscurus, Nucifraga columbiana, Loxia c. bendirei and other boreal birds which need not be mentioned here were common. Birds at this altitude were not as abundant as lower down but were far more interesting to us because of their northern affinities.

MIGRATION.

The spring migration here at the edge of the foothills was on an average about a week later than it was on the plains east of Denver, showing in all probability, that the birds came into this region from the plains area. Some species, as the Juncos, which had wintered in the foothills, moved down toward the mouths of the gulches and then migrated north, so that we noticed two distinct movements here, that of spring migrants from the south advancing up the gulches, and that of winter residents coming out of the foothills and leaving for the north.

Some species that had nested higher in the mountains began coming down in August into this country so that during this month we found considerable movement among the birds, noting several species as *Sphyrapicus thyroideus*, and *Myiochanes r. richardsoni*, that had not nested here but which became common then. Others as *Selasphorus platycercus*, *Spizella p. arizonæ* and *Sialia currucoides* increased greatly in numbers at this time.

There was a general tendency among the young birds of the higher zone breeders to work down the slopes through July and August, and this movement was more marked when the true migration began in September. Bird life in the higher altitudes was at all times rather local in its distribution and some localities, which appeared favorable to the presence of birds, as Mount Vernon and Turkey Creek Cañons, supported a very small number of species and individuals.

Our first trip into this region was made March 28, 1909, on which date we discovered practically no signs of approaching spring in the mountains and the typical winter birds were the only ones seen. Following this we made weekly one day trips almost without exception until November 14, on which date the last sign of sum-

mer bird life had disappeared, and the long mountain winter had begun. During the spring, snow storms and cold wet weather tended to retard bird movements, and a heavy sleet storm occurred as late as May 23 in the mountains. The season, from what we could learn, appeared to be a week later than usual, and the late rains caused unusual growths of vegetation in the mountains. Good weather continued throughout the summer and there was no appreciable amount of cold until the middle of August. Fall migration had ceased by November 7, and practically all the regular winter birds had arrived by that time.

The total number of trips made to this section was twenty-three, which being distributed uniformly over a period of seven months gave us ample opportunity to make a good representative collection of the birds of the region, with the exception of certain species of rare or unusual occurrence, whose presence might only be detected in a period of years, not months. Therefore, this paper is not offered as a complete list of the birds of the section, but rather as a basis for comparison between the distribution of bird life on the plains and in the closely adjacent mountains. A few notes made subsequently in this region are for convenience included here.

SUMMARY.

The field work recorded in this paper was all done in a restricted area along the eastern foothills of the mountains around Golden and Morrison, both in Jefferson County, Colorado. The region covered embraces, in the main, a range of elevation between 5600 and 7600 feet giving the zonal variation in bird life usual to similar changes in altitude.

The work done was so distributed throughout the spring, summer and fall that we were enabled to gain an idea of the distribution of the bird life during these seasons, and also to gather considerable data on migrations, spring and fall, and vertical movements to and from the higher altitudes. Twenty-three collecting trips were made between March twenty-eighth and November fourteenth, so that winter conditions were encountered both at the beginning and at the end of the period.

The total number of species of birds noted was 109 and specimens were taken of practically all of these, in many instances in large series. The following records are of particular interest, and will be found discussed more fully in their proper places; *Bubo v. lagophonus;* two supposed hybrids of *Junco h. mearnsi* × *Junco aikeni; Passerina cyanea, Catherpes m. conspersus* and *Sialia s. sialis.* As much material as possible bearing upon life histories was gathered, and this is embodied under the proper headings in the following pages.

Annotated List.

1. **Spatula clypeata.** SHOVELLER.— A flock of eight birds seen on the small reservoir on top of Lookout Mountain, August 17, 1913, is the only definite record of wild ducks for this district; but other species undoubtedly occur sparingly during migrations.

2. **Recurvirostra americana.** AMERICAN AVOCET.— One bird seen at the reservoir on Lookout Mountain, July 18, 1913, is the only record.

3. **Actitis macularia.** SPOTTED SANDPIPER.— An immature female taken at the reservoir on top of Lookout Mountain, July 25, at an elevation of 7500 feet. This bird is in typical immature plumage and has the down feathers still attached to the tips of the rectrices. There is reason to believe that it was raised here, as Mr. E. J. Oslar informed us that he observed a pair nesting at this reservoir during the summer of 1908. These birds were noted also occasionally along Clear Creek, below Golden, but were not common.

4. **Oxyechus vociferus vociferus.** KILLDEER.— Two immature females were taken August 1, near an alkali pool on South Table Mountain and during the entire month of August they were common in boggy openings along Clear Creek. On November 14, two were heard calling below Golden during a heavy snow storm.

5. **Colinus virginianus virginianus.** BOBWHITE.— This species (the progeny of introduced birds) is now a fairly common resident along Clear Creek. A few were seen October 3, as far west as Rockdale, almost between North and South Table Mountains.

6. **Phasianus torquatus.** RING-NECKED PHEASANT.— While these birds are quite plentiful on the plains (having been introduced some years ago in considerable numbers), they do not wander up into the mountains to any extent. However, a few are seen each summer in the fields on top of Lookout Mountain up to at least 7500 feet elevation. The farmers in this locality seem to think they are increasing in numbers in the higher altitudes.

7. **Dendragapus obscurus obscurus.** DUSKY GROUSE.— It was

rather a surprise to find this bird here so near Denver, and while they were not common, we saw frequent signs of their presence and occasionally came across the birds themselves. Their favorite food was the kinnikinnick berry which grew in abundance on Lookout Mountain, and all the grouse observed were seen there. We found feathers scattered about their dust baths in sunny places and noted their tracks in the snow leading through the forest growth. They were wilder here than they are back in the mountains, and when flushed went off with a clucking note. On September 19, we found a flock of seven in a weed-grown field and one was taken while the others, all nearly grown young, flew into some pines. The one taken on that date still retains the juvenile plumage about the head and traces of it persist along the median breast line. The band on the tail is also darker than in the adult.

8. **Zenaidura macroura marginella.** WESTERN MOURNING DOVE. — Common everywhere, from Clear Creek to the top of Lookout Mountain, the first arrival being noted April 25. The first nests were found at about 7500 feet, on May 23, when two were examined. One of these nests was built on a large flat rock on the very edge of a great precipice. The nest was built entirely of pine needles, was shaded by a dwarfed cedar and contained two eggs, one being a runt egg which measured only .76 × .61 inches. Two weeks earlier we found nests on the plains. This species continued common about Golden until the third week of August when most of them disappeared. At this time they became more abundant in the vicinity of Morrison and were perhaps attracted there from the surrounding country by the grain fields which were being cut. Three taken in Turkey Creek Cañon August 29, had eaten sunflower seeds and another small black seed which we did not recognize. The larger part of the birds were gone by the middle of September, though one was noted on Clear Creek November 16.

9. **Cathartes aura septentrionalis.** TURKEY VULTURE.— Noted occasionally from April to September. One seen on Bear Creek, below Morrison, April 14, and another at an altitude of 7500 feet above Golden, on August 18. The last bird recorded was seen on Lookout Mountain, September 26.

10. **Accipiter velox.** SHARP-SHINNED HAWK.— First noted on April 14, and seen from then until the middle of May. The first bird of the fall was seen in Chimney Gulch, September 19, when one dashed into a flock of Western Chipping Sparrows near us, but failed to kill. They were fairly common for a month after that, more being seen along Clear Creek than in the foothills.

11. **Buteo borealis calurus.** WESTERN RED-TAIL.— Seen occasionally all through the spring and summer, but more common during fall migration. The last bird was noted October 2.

12. **Falco sparverius phalæna.** WESTERN SPARROW HAWK.— This was the common hawk everywhere in the creek bottoms and the foothills. The first one was noted in Chimney Gulch, April 18, and after that they

were common. The birds were very noisy through the first week in May when nesting began, but during the summer months were not so noticeable. By October the moult was over and they were in full plumage. Ten of eleven specimens taken were submitted to Mr. H. C. Oberholser who pronounced them all *phalæna*. There is some variation in measurements and the smaller specimens are much paler than eastern birds.

13. **Asio wilsonianus.** LONG-EARED OWL.— Occasional along Clear Creek in early spring and late fall. Found nesting on Clear Creek about four miles east of Golden, April 24 and May 15, 1901.

14. **Otus asio maxwelliæ.** ROCKY MOUNTAIN SCREECH OWL.— This species was fairly common along Clear Creek up to the foothills, where it is resident and breeds during April, but could be overlooked easily on account of its retiring habits. A nesting female was noted April 3, in a hole in a cottonwood. No owls were seen at all in the foothills and only once did we find an "owl pellet" on Lookout Mountain. The single specimen taken appears to be typical *maxwelliæ*.

15. **Bubo virginianus lagophonus.** GREAT HORNED OWL.— An adult female taken October 2, in a gulch on North Table Mountain, was the only one seen. This bird rose from some rocks on a side hill and when shot fell with a broken wing. While we were endeavoring to capture it, we noticed a strong odor of skunk and upon skinning the specimen we found the stomach to be crammed with skunk hair and bones. This bird was submitted to Mr. H. C. Oberholser who identified it as *B. v. lagophonus*, making the second record for the state for this bird.

16. **Dryobates villosus monticola.** ROCKY MOUNTAIN HAIRY WOODPECKER.— During the spring these birds were rare, and a female taken April 25, in the barren hills north of Clear Creek was the only one seen. On August 22 we saw a magpie in close pursuit of one on Lookout Mountain. They darted in and out among the pines and as they passed me, I dropped the woodpecker, finding that it was an adult female in worn plumage. Two were seen September 19, and after this date they were fairly common, several being seen on every trip. One taken October 2, was in full plumage. A specimen was taken on Clear Creek below Golden, November 6.

17. **Dryobates pubescens homorus.** BATCHELDER'S WOODPECKER. — Rather rare in the region included in this paper. One taken on Bear Creek near Morrison April 14, and another noted April 16, on Clear Creek below Golden. We made special search for this small woodpecker but found it rarely.

18. **Sphyrapicus thyroideus.** WILLIAMSON'S SAPSUCKER.— Tolerably common on Lookout Mountain during the first part of the fall migration, but none seen during the spring. This was one of the birds that came into this region from the higher altitudes. An immature female taken August 8, was the first one seen. This bird was still in first plumage and both adults and young were moulting until the last of September when they disappeared. They were seen only among the pines at 7500 feet, and were very shy so that we probably overlooked some of them.

1. "NEST" AND EGGS OF RED-SHAFTED FLICKER BUILT BETWEEN STUDDING OF WALL OF FRAME DWELLING. MOUNTAIN RAT'S NEST AT RIGHT.
2. YOUNG LONG-CRESTED JAY. JUST OUT OF NEST.

19. **Melanerpes erythrocephalus.** RED-HEADED WOODPECKER.— An adult male was taken on Lookout Mountain at 7500 feet on May 23, and on June 3 others were seen in a valley near by preparing to breed. They were not as common however as they were along the streams on the plains. A small series of Colorado birds appears to have the bill averaging a trifle more slender than average Kansas specimens, otherwise there is apparently no difference between the two.

20. **Asyndesmus lewisi.** LEWIS'S WOODPECKER.— Fairly common in the foothills. Our first record was made May 16, when an adult male was taken, and afterward they were seen all through the spring and summer, up to October 16, which is the last date on which they were noted. They usually frequented rather barren hillsides where they perched in dead pines to watch for passing insects, which they captured after the fashion of a great awkward flycatcher. Once or twice we heard them give a rattling call not unlike that of *Centurus carolinus*, in the spring, but as a rule they are silent. By the last of July their family duties were over, and the birds were then found in parties of half a dozen or more and continued in these flocks well into September, until time for migration.

21. **Colaptes cafer collaris.** RED-SHAFTED FLICKER.— This was the only common woodpecker seen. They winter commonly on the plains, and on April 11 one was seen excavating a nesting hole at 7000 feet. They nested from the plains to the top of Lookout Mountain and were common during the summer, nests with young being found June 6. A Red-shafted Flicker built its nest between the clap-board siding and the lath and plaster inside wall of one of the cottages on Lookout Mountain. Upon its becoming a nuisance the hole it had made through the clap-board was repeatedly covered with a piece of wood nailed over the opening, but in each case the parent flicker promptly bored through the obstruction. This nest was separated only by a two-by-four beam from a cosy nest which had recently been occupied by a mountain rat (Plate XXXII, fig. 1). During September and October they were found in small flocks and spent much time searching the crevices of the rocks for insects. One specimen has all but two rectrices colored as in *C. a. luteus*.

22. **Phalænoptilus nuttalli nuttalli.** POORWILL.— Two of these birds were seen May 23, and one was taken. The first one was on a steep rocky hillside, covered with brush at about 7,000 feet. The bird flushed a few feet away, flying for a short distance with an irregular wing beat and then settled into a steady flapping rather owl-like flight. When alighting it darted suddenly to the ground, usually in an open space. The second was flushed higher up, just below the top of Lookout Mountain. It flew out from under a flat rock where it had taken refuge from a heavy sleet storm. This bird disappeared among the pines and we could not find it again. Mr. E. J. Oslar says that he has found them rather frequently in Coon Gulch where they probably breed occasionally. The single bird taken is typical *P. n. nuttalli*.

23. **Chordeiles virginianus henryi.** WESTERN NIGHTHAWK.—

This species was fairly common from the level of Golden upward. It was first noted May 16, and was fairly common during migration. A female taken July 25 showed no signs of having incubated. In the fall they were seen in small flocks migrating southward, and were last seen September 19, when a flock was noted high above the top of Lookout Mountain.

24. **Aëronautes melanoleucus.** WHITE-THROATED SWIFT.— This bird was first seen May 16, when we found twenty or more feeding along the side of Lookout Mountain. The wind was blowing a gale and the black and white forms of the swifts crossed before us with almost incredible speed. We would hear a twitter, see a flash and the birds would be far beyond gunshot in less time than it takes to tell it. We tried in vain to secure a specimen and finally gave up in disgust. A week later it was cooler and we found a small flock of them coursing low down, just back of Golden, where one was taken. They were now in pairs and were about ready to breed. They are not as noisy as *Chætura pelagica* and appear smaller on the wing than they really are. They nested somewhere in the mountains nearby as they were seen all through June and July. On August 8 we took two more from a flock on Lookout Mountain. One of these had the throat crammed as full as it would hold with flying ants. The last bird was noted September 26.

25. **Selasphorus platycercus.** BROAD-TAILED HUMMINGBIRD.— This species was rare here in the foothills although there was an abundance of flowers, and none were seen until June 6, when one was noted above Guy's Gulch. In August they became more common and were seen until the first of September. An immature female was taken August 8 on Lookout Mountain at about 7500 feet.

26. **Tyrannus verticalis.** ARKANSAS KINGBIRD.— This species was noted only a few times. On the plains further east where they were common, the first were seen May 9, but they were not observed near Golden until May 23. The last were seen August 22, when three immature birds were taken in an open field on top of Lookout Mountain. This was the only time we found them at this altitude — 7500 feet.

27. **Sayornis sayus.** SAY'S PHŒBE.— Fairly common on the plains. The first one was seen April 11, though further east they arrived at least a week earlier. On July 25 I took a young bird that had been out of the nest about a week, and several more were seen, that had undoubtedly been hatched in or close to Golden. Their call notes resembled those of the adults but were softer as is usually the case. Adults taken at the same time were in very worn plumage. An immature male was taken in a field on Lookout Mountain September 19, which was the only time they were noted at 7500 feet and was also the last record for the fall.

28. **Nuttallornis borealis.** OLIVE-SIDED FLYCATCHER.— We made only two records here for this species. An adult female was taken on May 16, at 6,000 feet in Chimney Gulch, and on August 8, another was seen on Lookout Mountain in company with some Western Wood Pewees.

29. **Myiochanes richardsoni richardsoni.** WESTERN WOOD PEWEE.

— This species was not found until the beginning of the fall migration. On August 8 we saw two, one of which was taken, and from this date until the end of the month they were fairly common, among the pines at about 7500 feet. They were found usually with flocks of Mountain Bluebirds that were feeding there. The last was seen in Turkey Creek Cañon on August 29.

30. **Empidonax wrighti.** WRIGHT'S FLYCATCHER.— A single bird was taken in Chimney Gulch at an altitude of 6,000 feet on May 16. Small flycatchers were practically absent from this region, and none of the species common in the higher mountains were found. Another *Empidonax* however was noted above Guy's Gulch on June 6, but was not identified with any degree of certainty.

31. **Otocoris alpestris leucolæma.** DESERT HORNED LARK.— On August 11 we found a scattering flock of these birds around an alkali pool on South Table Mountain. Two young birds about half grown and an adult male in worn plumage were taken. On the two Table Mountains and in their vicinity was the only country suited to these birds and they were seen nowhere else. On November 14 numbers were observed passing over in a snow storm and some of the flocks lit on the gravel bars in Clear Creek.

32. **Pica pica hudsonia.** MAGPIE.— The large size, loud notes and striking coloration of these birds made them a conspicuous part of the landscape and when they were not in sight themselves, we could usually see their bulky nests. There were full sets of eggs in many nests the second week in April, and in the higher altitudes incubation was well under way by May 1. By the middle of June the young birds were following the adults about or sitting in the trees near their nests if still unable to fly. The old birds were wise enough to keep beyond gun-range and not many were taken. They were very inquisitive and usually when we sat down to eat lunch one or two were in sight watching us. They would make a complete circle around us and as soon as we left came down to investigate our resting place. A hawk or an owl they followed with as much eagerness as crows do in the east and they were even seen in pursuit of other birds. One day when we had laid several birds in the shade beside a rock and were a few rods away among the pines a magpie came down and seizing a blue-bird made off with it. On another occasion three or four devoured a Mourning Dove. One evening in November a long straggling flock of at least fifty birds was seen flying across a valley, but usually we saw no more than half a dozen together. The thickened anterior edge of the nictitating membrane was colored a brilliant orange in adults though this could not be seen unless the corner of the eye was pushed back. This spot was more brilliant in spring than in fall and was more noticeable in the males than in the females though present in both. It served no apparent purpose and was probably merely for ornament.

33. **Cyanocitta stelleri diademata.** LONG-CRESTED JAY.— A common bird in the foothills above 7,000 feet. Rather a large series was collected from April to November showing them in all stages of plumage.

July 18, young were taken in the dull first plumage (Plate XXXII, fig. 2), and adults with the feathers much worn. By the end of the first week in August adults and young were moulting about the head and the old birds had regained most of the rectrices and remiges, and by the first of September the adults were in good condition, with the exception of the crest, while the young still showed the first plumage about the head and breast. By October 1 all were in full plumage, though up to this time the crests were still imperfect. In the present series there is a great variation in the number and distinctness of the black bars on the rectrices, apparently irrespective of age or sex, though a large per cent of the adult males appear to have these bars heavier. In one specimen there are only six of these bars, all very indistinct and obsolete on the proximal half of the feathers while another shows eighteen narrow bars, the last three extending under the upper tail coverts.

The sixteenth of May a pair of these birds evidently had a nest on Lookout Mountain but we could not find it. A week later however the birds were still in flocks, and not until the first of June were all mated. The first young — noisy and not as wary as the adults — were seen July 18, and after this date they were common. About the middle of August they began moving down the cañons, and were occasionally seen below 7,000 feet while two months later — during the latter part of October, they were seen commonly at the mouths of the cañons, and one was noted in Denver the last of September. There were more of these birds in Turkey Creek Cañon than anywhere else in the entire region, and here we were rarely out of sight or hearing of them. In September and October many of them frequented thickets away from the pines where they were usually found.

34. **Aphelocoma woodhousei.** WOODHOUSE'S JAY.— Half a dozen of these birds were seen on Clear Creek April 3 and one taken. They were seen also in Magpie Gulch April 25, and a pair in Chimney Gulch May 16, but were not noted again.

35. **Nucifraga columbiana.** CLARKE'S NUTCRACKER.— May 2 we found a flock of a dozen of these birds at the head of Chimney Gulch and took three of them. They were rather wild and hard to approach but when one was taken the others stopped for an instant. The feathers are very long and lax making the birds appear larger in life than they do in the hand. Those taken are much darker colored than fall specimens in fresh plumage, and one had the feathers of the breast smeared with pitch.

36. **Cyanocephalus cyanocephalus.** PIÑON JAY.— This bird was heard a number of times in Chimney Gulch in the spring and on September 26 one flew over our heads across a cañon. None were taken.

37. **Molothrus ater ater.** COWBIRD.— Only one was seen in the vicinity of Golden, although it is undoubtedly of regular occurrence. An adult male was found about a bunch of horses on July 25, below the mouth of Coon Gulch but was not taken.

38. **Xanthocephalus xanthocephalus.** YELLOW-HEADED BLACKBIRD.— Seen a few times in April and May along Clear Creek. The first bird of the season was noted on Bear Creek April 14.

39. **Agelaius phœniceus fortis.** THICK-BILLED REDWING.— Common along the creeks and in marshy growths along the edge of the foothills. The males wintered and were found in large flocks. In the spring they frequented thickets of plum-brush and growths of cat-tails as roosting places when not feeding, and when disturbed flew out with a loud roaring of wings. They were singing by the middle of April and the females arrived from the south about the end of the month, though the two sexes still flocked separately. By the middle of May they were paired and in some cases two broods were raised. Three were seen May 23 at 7,500 feet, the only time that we saw them " on top," and we saw several pairs south of Golden July 25, that evidently had young in the grass though we could not find them. By September 1 they were gathered in flocks, and the moult was nearly completed by the end of the first week in October. All the specimens taken are true *fortis* and this is the breeding form clear to the base of the foothills. Two adult males in rather worn breeding plumage had the middle wing coverts paler than in the spring birds but this was undoubtedly due to the wear on the feathers. Otherwise the series is very uniform both in coloration and measurements.

40. **Sturnella neglecta.** WESTERN MEADOWLARK.— Common along Clear and Bear Creeks and to the top of Lookout Mountain wherever there were open fields. They were noted along the creeks April 3, but were not seen at 7500 feet until April 18. They bred here and were common all summer and a few stragglers remained until the last of September. In October they were found in straggling flocks between the foothills and the Table Mountains south of Golden and were then in full plumage. They winter in some numbers along Clear Creek below Golden and up the Platte to Morrison.

41. **Icterus bullocki.** BULLOCK'S ORIOLE.— This species was tolerably common in the cottonwoods on Clear Creek and in the town of Golden. They arrived in the spring about May 10. None were seen in the foothills.

42. **Euphagus cyanocephalus.** BREWER'S BLACKBIRD.— Found along Clear Creek and in the town of Golden. The first week in May the males were seen strutting before the females with bills pointed up, moving the head rapidly up and down in a vertical direction, at the same time giving a thin sibilant " *see see.*" In the fall, the birds were found along Clear Creek in small flocks, and were noted here until the last of October.

43. **Pinicola enucleator montana.** ROCKY MOUNTAIN PINE GROSBEAK.— An immature male taken in a thicket of quaking aspens on the top of Lookout Mountain November 7, 1909. No others were seen though we made a careful search for them.

44. **Carpodacus cassini.** CASSIN'S PURPLE FINCH.— Half a dozen were seen on Bear Creek below Morrison April 14, and on April 25 we took an adult male in Tucker's Gulch north of Golden. They were not seen again.

45. **Carpodacus mexicanus frontalis.** HOUSE FINCH — Fairly

common in Golden and also seen along Clear Creek. April 11 a pair were evidently ready to build in an old boiler house north of the C. & S. tracks near Golden. They were seen in this vicinity all summer and in August we took one on South Table Mountain. In November they were gathered in flocks in the Clear Creek bottoms where several more were taken.

46. **Loxia curvirostra bendirei.** BENDIRE'S CROSSBILL.— A good series of Crossbills collected on Lookout Mountain in April and May are all referable to this subspecies. The first ones were seen April 18, when we encountered a small flock and they were fairly common up to May 23. Usually they fed in the pine trees on the cones and were hard to locate when silent. Their bills however made a loud cracking noise when feeding, betraying their presence and the birds themselves were very tame. On one occasion we observed a flock of about 50 feeding on the ground around a spring but when flushed they went back into the pines and remained quiet, their throats being full of seeds. In none of those taken were the sexual organs developed and there were no indications of their having bred at any recent period, all the birds taken being adults. Some of the males taken were very brightly colored and all were in very good condition.

47. **Acanthis linaria linaria.** REDPOLL.— Two of these birds seen on Clear Creek April 3, and one taken. During the latter part of March others were seen but they had all gone north by the end of the first week in April.

48. **Astragalinus tristis.** GOLDFINCH.— May 6 there were large flocks of migrating Goldfinches in the cottonwoods along Clear Creek and they were seen occasionally until the first of June. They were not noted again until the last week in October and on November 6 a small flock was seen on Lookout Mountain at 7,500 feet. Probably both *tristis* and *pallidus* occur here but this cannot be stated positively on account of lack of material. An adult male taken May 31 at Castle Rock, Colo., is intermediate between the two, but apparently nearer *tristis*. An adult female from Willard, Colorado, taken October 22, is true *pallidus*, being larger, paler and grayer than eastern birds. These are the only Colorado specimens available at present.

49. **Astragalinus psaltria psaltria.** ARKANSAS GOLDFINCH.— During the summer this species was fairly common in Golden and casual along Clear Creek. September 19 a small flock was seen at the mouth of Chimney Gulch and from then until October 10, they were fairly common up to 7,000 feet, usually being seen in flocks of from four to six, probably family parties.

50. **Spinus pinus pinus.** PINE SISKIN.— The series of this bird in the present collection shows the usual variation of color, irrespective of age or sex. Some have a very distinct buffy tinge on the under parts and these have the dusky streaks on the ventral surface much narrower and paler in color. The first birds were noted on Lookout Mountain April 18 and the first week in May they were feeding like *Astragalinus tristis* in flocks in the tops of the cottonwoods along the creek bottoms. These flocks did not

break up until the first of June and the birds were nesting by the middle of the month. They bred apparently from the plains up into the mountain parks and were most common in the mountains. By July 18 young were seen out of the nest, and from then until October 10 they were common on Lookout Mountain. During the fall months they were quicker and more restless seldom remaining long in one locality. The adults were very anxious about their young and were continually making short circling flights out over us when we were near, calling excitedly and betraying themselves by their anxiety. Immature birds were still moulting the first week in October.

51. **Passer domesticus.** ENGLISH SPARROW.— Common in Golden and around some of the ranch houses.

52. **Pœcetes gramineus confinis.** WESTERN VESPER SPARROW.— Common on the plains and found in the highest altitude in the region in question wherever there were open fields. There is very little variation in a small series of these birds except in freshness of plumage, which is due entirely to the season. The first one was seen April 18, and by May 2 they were common. Two broods were raised, the first in May, the second in July. The males had a second song period about the middle of the latter month and on August first there were apparently many nests with young on South Table Mountain, as females were seen frequently with food in their bills. From then until the middle of September they were very retiring and the last ones, a small flock scattered over a knoll on North Table Mountain, were noted October 2 and one was taken.

53. **Passerculus sandwichensis alaudinus.** WESTERN SAVANNAH SPARROW.— Noted in September around the reservoir on top of Lookout Mountain.

54. **Ammodramus savannarum bimaculatus.** WESTERN GRASSHOPPER SPARROW.— July 25 we heard the weak song of this bird near a little spring on the flat south of Golden and after a short search discovered the bird perched on a weed and secured it.

55. **Chondestes grammacus strigatus.** WESTERN LARK SPARROW. — Fairly common in the open near Golden, but not found as frequently as farther east. None were noted here after the middle of June.

56. **Zonotrichia leucophrys leucophrys.** WHITE-CROWNED SPARROW.— An adult female taken September 19 is the only specimen of this variety taken. The relative abundance of this and the following subspecies can only be determined by more extended observations. *Z. l. leucophrys* should be the first one to occur in the fall and this is true in the present case while *Z. l. gambeli* was not found until September 26.

57. **Zonotrichia leucophrys gambeli.** GAMBEL'S SPARROW.— Common migrant. In the spring the first one was taken April 25, and they were found up to May 9, from the plains to the top of Lookout Mountain. In the fall the first one was noted September 26. They had reached the height of their abundance October 10, and the last one was seen November 7. They frequented the bushy thickets in the gulches and were especially

common along a dry gully south of Golden. Spring birds have the indistinct white throat patch more pronounced than fall birds and one immature male taken November 7 showed a few black feathers in the crown.

58. **Spizella monticola ochracea.** WESTERN TREE SPARROW.— The last bird was seen in the spring, April 3, and the subspecies did not appear again until October 17. The first were seen at the plains level and a week later they were common and were taken at the highest altitude on Lookout Mountain. Up to November 7 all taken were adults with the exception of a single immature male taken October 24. After that date the immature birds were the commoner of the two. In no way did these birds differ from the eastern variety in habits. With the heavy snows in November the greater number moved from the mountains to the lower level of the various creeks.

59. **Spizella passerina arizonæ.** WESTERN CHIPPING SPARROW.— Common during the spring and summer and very abundant from the last of August to the tenth of October. In a large series of this subspecies there is no approach to *S. p. passerina* of the Eastern United States. Adults only were taken up to August 22, when they were in worn plumage. On the 29th young birds in the first striped plumage were taken, and a week later some specimens had completed the moult into the winter dress. The striped birds were taken up to September 26, and others were variously marked at that time according to the stage of development of the moult. October specimens were in perfect condition. There is much variation in immature birds as to the amount of rufous concealed in the crown, and also in the distribution of the black occipital stripes. In some cases these are uniform over the entire top of the head, and in others they are restricted to the lateral line.

The first bird was taken April 25 near Golden and they were fairly common up to July 25, when they began to increase in numbers and probably were coming down out of the mountains. August 1 on South Table Mountain there were large flocks, composed largely of adults, feeding among the loose rocks near some water holes. At our approach they straggled off giving only a faint "*tsip*" as a call note. The adult birds were common to the first of September but by the 19th of the month only the immature specimens were found. They were common from Golden to the top of Lookout Mountain and it was a curious fact that those at the lower levels were all in worn plumage and moulting, while those higher up had attained the full winter dress. They were found in large flocks and were continually on the move. Stray birds kept dropping in every few minutes to good feeding grounds and when a large flock was started they went off through the bushes and over the hills at a rapid rate.

October 10 stragglers were common but the large flocks had disappeared and the last bird was seen October 17.

60. **Spizella breweri.** BREWER'S SPARROW.— August 1 we took four of these birds on South Table Mountain, three adults and one immature. The birds were very shy and retiring, probably due to the season and the

condition of their plumage. The only note given was a low "*tsip.*" They undoubtedly occur regularly but this was the only time we observed them.

61. **Junco aikeni.** WHITE-WINGED JUNCO.— Common in the late fall but only seen once in the spring. Two specimens were taken April 11 at an altitude of 7500 feet and the bird was not found again until October 24. Several were taken on this date and on November 7 they were as common as any of the other Juncos. In actions they were similar to the other Juncos but in mixed flocks they could usually be distinguished by their large size. On one occasion we saw them "fly-catching" after insects, from a thicket of plum brush. Some of the immature females in the present series have merely a trace of the white wing bars, but can be readily distinguished from *hyemalis* by their large size.

62. **Junco hyemalis hyemalis.** SLATE-COLORED JUNCO.— Specimens were taken April 11 at Golden, and April 14 at Morrison, but we can say nothing more concerning the status of this bird. None were observed with certainty in the fall.

63. **Junco hyemalis connectens.** SHUFELDT'S JUNCO.— Winter resident and common migrant. From April 11 to 14 appeared to be the height of the spring migration, and most of the birds were found along the edge of the foothills. After the latter date they were not found again until October 24, while on November 7 they were common with the other Juncos in large mixed flocks and were working back into the foothills.

64. **Junco hyemalis montanus.** MONTANA JUNCO.— This should be a regular winter resident but in rather a large series of Juncos there are only two specimens. One taken April 25 which is hardly typical (being near true *hyemalis*) and one October 10.

65. **Junco hyemalis mearnsi.** PINK-SIDED JUNCO.— This was the common Junco of the region and was found in the spring up to May 2, much later than any other of the migrant varieties of the same genus. The first fall specimen was taken October 2, and by the tenth of the month they were common again. These birds had the habits common to the genus so that no mention need be made of them here. They were found from the plains to the highest points in the region. There are four specimens that appear to show hybridization with *J. aikeni*, as in all there are present quite well defined wing bars, though otherwise the birds are similar to true *mearnsi*. These are all immature males taken in October and November. One has been examined by Mr. H. C. Oberholser, who has confirmed the identification as *J. h. mearnsi* × *J. aikeni*. It may be stated here that there are two specimens in the Colorado Museum of Natural History in Denver and one other in the collection of the State Normal School at Greeley, Colorado, which show the same characteristics.

66. **Junco phæonotus caniceps.** GRAY-HEADED JUNCO.— Common summer resident down to 7500 feet. During the migration found down to the plains. The first one was taken April 14 below Morrison, and they were common up to the first of June when all were found in pairs at 7500 feet. They were ready to breed and frequented the thickets of

quaking aspens and low pines. The males perched quietly in the pines from 6 to 30 feet from the ground and gave their pleasant trilling songs every minute or two. This song seemed louder and clearer than that of *J. h. hyemalis*, but this may have been imagination on our part. One nest which was found May 30, 1913, contained 4 fresh eggs and was built in a depression in the ground under a thick net-work of low hanging branches of a young Douglas Fir on a sparsely wooded hillside (Plate XXXIII, fig. 1). The nest was of usual construction and thickly foliated branches bending down to the ground offered almost perfect concealment. The nest was discovered by the female flushing noisily at a distance of several feet. After June they disappeared, probably going to a higher altitude, and were not taken again until September 19. They were fairly common during the fall and became abundant with the other species of *Junco* the last of October. Some of the females in the series have the rusty patch on the back much paler than others. One immature female, taken November 7, has a rufous line on each side of the crown extending backward to above the auricular region, while another of the same sex taken October 2, shows faint rusty tips to the feathers on the occipital and nuchal regions.

67. **Melospiza melodia montana.** MOUNTAIN SONG SPARROW.— Common resident, more abundant during migrations. Found as usual in thickets and weed patches not far from water. All the specimens taken come from the plains level, but on October 24 we heard one near a spring on Lookout Mountain. November 14 the birds were common along Clear Creek, though there was six inches of snow and the bushes were veritable snow banks from the masses that had caught in the branches.

68. **Melospiza lincolni lincolni.** LINCOLN'S SPARROW.— First noted May 2; common until May 23. None appeared to breed here, and in the fall they were taken from September 26 to October 10. This bird was found in the brush covered gulches and although frequenting the same localities as the song sparrow, also occurred back in the foothills away from water.

69. **Pipilo maculatus montanus.** SPURRED TOWHEE.— Summer resident, very common. The first one was seen May 2, by the 16th they were common, and by the 23d they were preparing to breed. The first nest was found May 30 built under a bush at the edge of a bank. It contained four fresh eggs and several more were found from then until the middle of June (Plate XXXIII, fig. 2). The first young were taken July 18 and on this same date the males began to sing again, preparatory to raising a second brood. They were moulting all through September and the last one was taken October 17. These birds frequented the thickets and bushy draws from the plains to the top of Lookout Mountain, and were noisy and rather conspicuous. When pursued however they took good care to keep out of sight in the bushes. The song was simpler than that of *Pipilo e. erythrophthalmus* consisting usually of a simple trill, but there were many puzzling variations which led us at times into looking for some new bird. The ordinary call note was a harsh mewing "*jo-ree*" The call note of the

1. NEST AND EGGS OF GRAY-HEADED JUNCO. BUILT UNDER LOW SPREADING BRANCHES OF SMALL DOUGLAS FIR ON OPEN WOODED HILLSIDE.
2. NEST AND EGGS OF SPURRED TOWHEE. BUILT AGAINST BASE OF QUAKING ASPEN ON STEEP SLOPE OF RAVINE.

young birds was a thin "*tseet.*" In a series of forty of these birds there are apparently no true *arcticus*. Many of them have as much white on the outer tail feathers as the latter subspecies and some of these have the same measurements for the tail itself, but all have the coloration much deeper and the rufous of the flanks exactly as in *montanus*. A large number of breeding birds have the above characteristics, and so appear to be slightly intermediate, but are much nearer *montanus*, and cannot be mistaken when compared with Kansas specimens of *arcticus*.

70. **Oreospiza chlorura.** GREEN-TAILED TOWHEE.— Common summer resident, but not as abundant as the preceding species. The first ones were seen May 16, and during migration they were found as low as the mouth of Chimney Gulch. Later however they were not seen below 7500 feet, and June 6 they were nesting. Young just out of the nest were taken July 18, and July 25, the males were in full song again, so that probably a second brood was raised. The last bird of the year was seen October 2, and they were seen on the plains 20 miles from the foothills September 7. The males had a rather pleasing song and also a mewing call note, very similar to that of *Dumetella carolinensis*. The call of the young birds could not be distinguished from that of the young of *P. m. montanus*. The adults spent much time on the ground. On one occasion one ran across an open space and was shot by mistake for a chipmunk. An immature female in full fall plumage taken October 2 had the rufous of the crown obscured by grayish olive-green tips to the feathers.

71. **Zamelodia melanocephala.** BLACK-HEADED GROSBEAK.— Tolerably common along Clear and Bear Creeks and seen occasionally in the town of Golden where they were noted May 20 and June 6. We have no fall records for this species.

72. **Passerina cyanea.** INDIGO BUNTING.— An adult male was taken on Clear Creek below Golden on August 1, 1909. Attention was attracted to the bird by its song and it was followed and secured. Another one was heard in the same locality later on but could not be located. The latest exact date given by Cooke in his "Birds of Colorado" is June 6, so that our bird is apparently the only mid-summer record for the state.

73. **Passerina amœna.** LAZULI BUNTING.— Fairly common summer resident in certain localities. They were not noted until the first of July here but probably arrived the last of May. They were found in the dry brush covered gulches opening into the foothills and like *P. cyanea* heat appeared to make no difference to them. The males sang from the tops of dead trees in the blazing sun and when approached dropped down into the dense thickets of plum-brush, where it was impossible to find them. Usually they took good care to keep out of gun range and flew back and forth across the draws ahead of us. The song was somewhat on the order of that of *Dendroica æstiva* and both sexes had a sharp chipping call note. Young birds out of the nest were found August 8, and by September 1 the birds had disappeared.

74. **Calamospiza melanocorys.** LARK BUNTING.— This bird was

not observed here until July 25, when about a dozen males were found at the foot of the eastern slope of Lookout Mountain, below Dead Man's Gulch. They were apparently located here as they kept in the same locality, and as only one female was seen we took them to be incubating. On the plains country to the east this species was common from May 12 on and was breeding June 13, but the Golden birds appeared to have arrived later. On August 1 we found loose flocks feeding over the top of South Table Mountain which had evidently come up from the warmer levels below. These were moulting rather badly and were very wild. The birds disappeared entirely by the last of August though they lingered a little later in the plains country.

75. **Piranga ludoviciana.** WESTERN TANAGER.— A male seen August 8 among the pines on Lookout Mountain was the first one noted here. On October 2 we took two among the cottonwoods on Clear Creek and saw several others. They were in good plumage and were exceedingly fat. This species should be of regular occurrence during migrations.

76. **Petrochelidon lunifrons lunifrons.** CLIFF SWALLOW.— This species arrived May 12 and was of transient occurrence during the migration. A few pairs nested under the eaves of a house near the School of Mines in Golden and were seen flying over the surrounding country until September 1.

77. **Hirundo erythrogastra.** BARN SWALLOW.— This species first appeared May 16 and was fairly common in the open region around Golden until September 1. In August they were in small flocks and the old birds were feeding their young of the second brood. The last seen were noted on Clear Creek October 2.

78. **Tachycineta thalassina lepida.** NORTHERN VIOLET-GREEN SWALLOW.— First seen May 16 and fairly common then at the base of the foothills. During the first week of June they were seen at 7500 feet and after this were not found again until August 8. Then one or two family parties were found on the top of Lookout Mountain and the adults were feeding the young. Not seen after September 1.

79. **Bombycilla garrula.** BOHEMIAN WAXWING.— Found in flocks on Clear Creek during the middle of March and a few noted April 3, but none taken.

80. **Lanius borealis.** NORTHERN SHRIKE.— First seen October 24, and fairly common after that along the creeks and bushy thickets. None were seen during the spring.

81. **Vireosylva gilva swainsoni.** WESTERN WARBLING VIREO.— One taken May 23 in Chimney Gulch and one or two seen occasionally during the summer along Clear Creek. Last found Spetember 9, during the fall migration.

82. **Vermivora virginiæ.** VIRGINIA'S WARBLER.— Common migrant and summer resident from the beginning of the foothills up to nearly seven thousand feet. Most abundant at 6000 feet. These birds were first seen May 16 when they were common. The first of June they were

nesting and by July 18 had young out of the nest. They disappeared by the end of the first week in September. The Virginia's Warbler resembles *Vermivora r. rubricapilla* in its habits, except that it frequents the bushes instead of the high trees, and has a song almost exactly like that bird. In the late summer they were found in family parties and could be located usually by the sharp chipping notes of the adults. The brushy draws and thickets of Chimney Gulch were a favorite resort with them but they were more often heard than seen.

83. **Vermivora celata celata.** ORANGE-CROWNED WARBLER.— Fairly common along Clear Creek from May 6 to May 16. Not noted during the fall.

84. **Vermivora celata lutescens.** LUTESCENT WARBLER.— Found in the spring from May 6 to May 16, and taken once on Lookout Mountain Sept. 19. The relative abundance of *celata* and *lutescens* cannot be gauged from the meager series in the present collection. We have two of the former and four of the latter, and of these all but one *lutescens* were taken in the spring.

85. **Dendroica æstiva æstiva.** YELLOW WARBLER.— Arrived by the end of the first week in May and was noted along Clear Creek and in the town of Golden all summer. During the spring migration a few were seen in the small draws near the mouth of Chimney Gulch. Two adult males taken agree closely with Kansas specimens.

86. **Dendroica coronata.** MYRTLE WARBLER.— Found sparingly along Clear Creek below Golden, from the first to the sixteenth of May. None were seen in the foothills nor was the species noted during the fall.

87. **Dendroica auduboni auduboni.** AUDUBON'S WARBLER.— Arrived about April 25 and was common until May 20 along Clear Creek. Only a few were seen in the foothills, though a female was taken on Lookout Mountain as late as June 6. It was probably a stray here however as it is doubtful if the bird breeds this low down. During the fall it occurred sparingly in the foothills from September 5 to October 10 but was not observed in abundance at any time.

88. **Oporornis tolmiei.** MACGILLIVRAY'S WARBLER.— First seen on the edge of the foothills May 16 and was common from the mouth of Chimney Gulch up to seven thousand feet by May 23. They were very restless and active and had a sharp chipping note besides the song. They were fairly common all summer in this locality. The last one, a female, was taken September 26.

89. **Geothlypis trichas occidentalis.** WESTERN YELLOW-THROAT.— Occasional along Clear Creek during the summer, but more common further east in the plains country, where they arrived May 5.

90. **Icteria virens longicauda.** LONG-TAILED CHAT.— Several noted in a draw on South Table Mountain facing Clear Creek on August 1 and one taken. They were still in full song and as usual were very secretive. We heard them several times during August along Clear Creek.

91. **Anthus rubescens.** AMERICAN PIPIT.— Tolerably common mi-

grant. Noted once May 16, and in the fall seen from October 10 to November 1 in the open flat between the foothills and the hog-back. These birds were all seen in the air and were not observed feeding.

92. **Oreoscoptes montanus.** SAGE THRASHER.— August 1 we found a few of these birds in the scattering bushes on South Table Mountain. They were very shy and were seen at a distance perched in the bushes, looking like big wrens. Two immature birds in juvenal plumage were taken but we found it impossible to secure any of the adults. They were not seen again but will probably be found occurring locally in similar localities.

93. **Dumetella carolinensis.** CATBIRD.— Tolerably common along Clear Creek during the spring migration and a few remained for the summer. Last seen September 7.

94. **Salpinctes obsoletus obsoletus.** ROCK WREN.— Common summer resident on rocky hillsides. First seen May 2 when it was fairly common and part of the birds appeared to be mated. They were more often heard than seen and usually scolded and sang from among rock slides and boulders above or below us where it was useless to follow them. On South Table Mountain they were more abundant than anywhere else and were also tamer than usual. A young Rock Wren just old enough to fly was taken by hand because of its weakened condition, and upon examination was found to be infested with large white grubs several of which had buried themselves deep into the bird's head and were gradually sapping its vitality. These grubs were nearly one half inch in length and were all buried out of sight under the skin. All the birds in the brood with the exception of this one were apparently fine healthy specimens. The last birds of the year were taken at the base of North Table Mountain October 2, where they were probably migrating as they were unusually silent.

95. **Catherpes mexicanus conspersus.** CAÑON WREN.— On April 11 we found two of these birds in Magpie Gulch north of Clear Creek Cañon. They were on a rocky hillside about 400 feet above the bottom of the Gulch and our attention was attracted to them by the clear song of the male, barely audible above the rushing of the snow water at our feet. We secured one of these birds, the male, but lost the other. Another was seen back of Lookout Mountain on May 24 and on July 25 we heard a male singing from a rock slide in Coon Gulch, but could not get to it. August 1 we took an immature female on South Table Mountain in full plumage and these constitute our records for this bird. It has been noted from this region before by Mr. Test of Golden and this is one of the most northern localities in the state where it has been found, though Mr. L. J. Hersey notes that it is common in Boulder Cañon. The presence of the bird here in July and the capture of the young bird in August that had just attained full plumage would tend to show that it bred here.

96. **Troglodytes aëdon parkmani.** WESTERN HOUSE WREN.— Fairly common summer resident. First seen May 9, and fairly common then in the mountains. They nest commonly in bird-boxes and nooks

around all the cottages on Lookout Mountain, becoming very tame and raising two broods. They were last seen October 2.

97. **Certhia familiaris montana.** ROCKY MOUNTAIN CREEPER.— First seen September 19, when one was taken in the pines on Lookout Mountain. They were heard and seen occasionally up to the last of October in this same locality, but we took no more specimens. None were noted during the spring.

98. **Sitta carolinensis nelsoni.** ROCKY MOUNTAIN NUTHATCH.— Common resident in the foothills and found sparingly along Clear Creek and Bear Creek. Most of them preferred the higher altitudes and were not found below 7000 feet. In August the young birds began to work down the slopes and by September 1 they were scattered over the entire region. The molt was not wholly finished until the first of October.

99. **Sitta canadensis.** RED-BREASTED NUTHATCH.— One taken on October 10 on Lookout Mountain was the only one seen. Our attention was attracted to it by its thin piping note, but it was fifteen minutes before we could locate it among the pines and another ten before it was finally secured.

100. **Sitta pygmæa pygmæa.** PYGMY NUTHATCH.— One of the commonest birds in the mountains above 7,000 feet. In April and May we found them in flocks of twenty-five or thirty hunting fearlessly through the pines, giving their soft notes continually and traveling rather rapidly. They were paired by the first of June and on the 6th, we found a nest containing five fresh eggs. The nest was in an old woodpecker hole in a stub about twenty feet from the ground, and was made up of feathers, hair, etc. The adults were much excited when we approached, and it took only a little search to find the nest. All through August we found small family parties of these birds and by September they were in full plumage, much brighter colored than in spring. Nearly all the specimens in the large series taken have the feathers of the abdomen much worn, probably by the rough bark of the pines. About the first of October they greatly decreased in numbers though a few were noted until the close of our collecting trips in November.

101. **Penthestes atricapillus septentrionalis.** LONG-TAILED CHICKADEE.— During the spring and summer we found these birds sparingly along Clear and Bear Creeks but they did not appear in the foothills until September 26. By the middle of October they were fairly common and continued so until our observations ended. With the coming of snow in the mountains in November they increased in numbers along the creeks and were found in small flocks. In the mountains they appeared to avoid the pines and spruces as feeding grounds, and were found only in the quaking aspens or occasionally in clumps of mountain maple.

102. **Penthestes gambeli gambeli.** MOUNTAIN CHICKADEE.— Common resident in the mountains above 7,000 feet. They were very common until the first of May and then decreased in number. A few were noted during June at the highest altitudes, and by July 18 they were leading their young through the pines. July and August specimens were very

ragged and not until September 19 were birds in full fall plumage taken. These birds were found almost entirely in the pines and had about the same habits as the preceding species. The Mountain Chickadee could be distinguished by its notes with ease as it drawled them out in a different tone from that of *P. a. septentrionalis*. During August the young worked slowly down the slopes of the mountains and on October 16 were seen on Clear Creek below Golden and from this on were common there.

103. **Regulus calendula calendula.** RUBY-CROWNED KINGLET.— Noted once in the spring but fairly common in the fall migration. The first one was seen September 19 and the last one October 19. In the mountains they were found in the quaking aspen thickets, but the first week in October they were also common along Clear Creek.

104. **Myadestes townsendi.** TOWNSEND'S SOLITAIRE.— Common in the mountains above 7,000 feet and occurring down to the plains. During the spring it was first seen April 18 and was common singly or in small flocks until May 2. The birds were ground feeders and were eating Kinnikinnick berries and what insects they could pick up. In their actions they reminded us strongly of Robins at times and again of Bluebirds. They always chose the topmost twig of a tree for a perch, and dead limbs were favorites with them, but on windy days they took refuge within the pines. We found it rather hard to approach them though usually they only flew a short distance. In the fall the first bird was taken August 22, but they were not found again until October 10. They were fairly common until November 7, when the last one was seen. On this date they were found in sunny hollows on the side slopes and were singing a low warbling song. In the fall they were much more common in the gulches at the lower levels, and were feeding on choke-cherries to some extent. The one taken August 22 was moulting from the spotted juvenal plumage. Fall birds showed more white on the tertials than those secured in the spring.

105. **Hylocichla ustulata swainsoni.** OLIVE-BACKED THRUSH.— Common migrant in the spring but not noted in the fall. First seen May 9 and the last one taken June 6. On the latter date we secured a single bird in a thicket of quaking aspens on Lookout Mountain, and on picking it up noticed a hard lump in the throat. On dissection we found it to be a medium sized ground beetle whose claws, catching in the œsophagus had swung the body around and held it there partially closing the aperture. Several other insects were lodged against the obstruction but the bird did not appear to be distressed by it as it was fat and in good plumage. Mr. E. J. Oslar kindly identified the beetle as *Aphodius* sp., a common representative of the family *Scarabæidæ*. This wound was apparently at least two weeks old as the gullet was healed completely and the skin dried down hard around the obstruction.

106. **Planesticus migratorius propinquus.** WESTERN ROBIN.— Common everywhere. On the plains they were paired by the end of the first week in April but in the mountains we found them occurring in loose flocks as late as June 6 though they began breeding immediately afterwards.

They were very restless and flew back and forth across the ridges and were usually rather wild. The moult began the last of July and by the middle of September specimens in full plumage were taken. At this date we found flocks of young probably of the last brood scattered among the bushes between six and seven thousand feet, while on top there were similar flocks in full winter plumage. It was also noticed that during the spring the birds of the plains level that bred early assumed the summer plumage at the same time, while the birds in the mountains did not change for nearly a month later. During October Western Robins were found in the gulches in large flocks, feeding on haws and thorn apples.

107. **Sialia sialis sialis.** BLUEBIRD.— A single bird taken at the foot of Dead Man's Gulch, May 2, was the only one seen. They appear to be rare in this locality, though there are numerous records of their occurrence in the state. The present bird — an adult female — averages a trifle paler than Kansas specimens, but agrees with them in measurements.

108. **Sialia mexicana bairdi.** CHESTNUT-BACKED BLUEBIRD.— A pair collected June 6 on Lookout Mountain were the only ones seen. These birds had a nest containing five incubated eggs, in a woodpecker hole in a pine about 30 feet from the ground on a steep hillside at the edge of an open pine grove. The cavity was about ten inches deep by three inches in diameter and the eggs were laid on a very scant lining of fine inner bark, quite neatly cupped. The nest did not resemble that of the Mountain Bluebird in any particular.

109. **Sialia currucoides.** MOUNTAIN BLUEBIRD.— Fairly common summer resident throughout the region, but not as abundant as at higher altitudes. We found the first ones already mated April 25 and from then on they were fairly common. A Mountain Bluebird built its nest in the wall of the same cabin used by the Flicker noted above. The entrance to the nest was less than two feet above the ground and the eggs themselves rested in a cranny between the timbers about a foot below the opening. This is undoubtedly one of the lowest bluebird nesting sites on record. During August there were large flocks principally of young birds among the pines at 7500 feet where they fed on the ground or caught insects on the wing. The only note given was a low *turr-r-* similar to that of the eastern bluebird. We collected quite a series of these young birds expecting to find that part of them were *S. m. bairdi*, but were disappointed in this. During September we noticed occasional small flocks, but none were seen after the first of October.

EARLY RECORDS OF THE WILD TURKEY.[1]

BY ALBERT HAZEN WRIGHT.

ONE of the best criteria for the determination of our most distinctive and indigenous forms is the perusal of the journals and accounts of foreign sojourners in this country. The wild turkey, "America's noblest game bird" probably receives more extended notice in this manner than any other North American avian form. Furthermore, according to our own chroniclers, no bird enters the life of the early days of this country more than it.

The explorer, La Salle (Jan. 1687) finds,[2] "the Plenty of wild Fowl, and particularly of Turkeys, whereof we killed many, was an ease to our Sufferings, and Help to bear our Toil with more Satisfaction." The early pioneers say,[3] "the breast of the wild turkey we were taught to call bread." Their neighbors, the aborigines, pray,[4] "O great being! I thank thee that I have obtained the use of my legs again, that I am able to walk about and kill turkeys...." The noted guest of this country, Lafayette, takes wild turkeys back with him to his farm at La Grange where he exerts,[5] "himself to multiply their numbers." Some courtly travellers like Lady Wortley have,[6] "a great fancy for tasting and

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[1] The general literature of the wild turkey is quite extensive, and we can mention only a few of the better and more important accounts. They are: Pennant, Thomas, An Account of the Turkey. Phil. Trans., LXXI, 1781, pp. 67–81, also Arctic Zool., pp. 291–300; Buffon, Complete Oeuvres de, Tome XXXI, Nouv. Ed. Oiseaux II, Paris, 1824, pp. 178–209 (orig. edit. Ois. II, pp. 132–162); Bennett, E. T. The Gardens and Menagerie of the Zoological Society Delineated. London, 1835, Birds, Vol. II; Newton, 1896, pp. 994–996; Grinnell, G. B. Forest and Stream, 1909, pp. 852, 891, 892; McIlhenny, E. A. Outdoor World and Recreation, Jan.–Mar., Dec. 1913, Jan. and Feb. 1914; Beckmann, John. A History of Inventions and Discoveries. 2nd edit. corrected and enlarged. 4 vols. Vol. II, London, 1814, pp. 350–372.

[2] Joutel, M. A Journal of the last Voyage Performed by M. de la Salle to the Gulph of Mexico, etc. Translation, 1714, p. 82.

[3] Howe, Henry. Hist. Colls. of the Great West. Cincinnati, 1873, p. 210.

[4] An Account of the Remarkable Occurrences in the Life and Travels of Col. James Smith, etc. Lexington, 1799. Reprint, Cincinnati, 1870, p. 96.

[5] Levasseur, A. Lafayette in America in 1824 and 1825; etc. Transl. by Godman. Phila., 1829, Vol. II, p. 120.

[6] Wortley, Lady Emmeline Stuart. Travels in the United States, etc. During 1849 and 1850. New York, 1851, p. 128.

trying fall sorts of unearthly, half-supernatural dishes.... As it was, we asked for wild turkey.... I believe these things.... are accounted very good and it amused us trying and experimentalizing on them." In this connection, J. F. Cooper remarks,[1] "Of fowls there are a rare and admirable collection!....it would do your digestive powers good to hear some of the semi-barbarous epicures of this provincial town expatiate on the merits of....wild turkies, and all the *et ceteras* of the collection."

Other travellers always bring their muskets with them[2] "to shoot the wild geese and turkies that some of our travellers in America describe so fluently,...." They "were always on the watch for an opportunity of practising (on shipboard), believing that they should have such excellent sport in America shooting wild turkies." Early in life, the native youth is taught the wiles of the turkey hunter.[3] "One important pastime of our boys was that of imitating the noise of every bird and beast in the woods. This faculty was not merely a pastime, but a very necessary part of education, on account of its utility in certain circumstances. The imitations of the gobbling and other sounds of the wild turkeys, often brought those keen-eyed and ever watchful tenants of the forest within reach of the rifle. The Indians, when scattered about in the neighborhood, often collected together, by imitating turkeys by day, and wolves or owls by night." "Apropos of the rifle.... The inhabitants of this country....(were) wonderfully expert in the use of it: thinking it a bad shot if they (missed) the very head of a....wild turkey, on the top of the highest forest tree with a single ball.[4] In fact, this ability to hunt the turkey successfully is so well known an accomplishment of the American man that Fanny Wright (d'Arusmont)[5] in speaking of better conditions for American women mentions it as one of the distinctive pursuits or pastimes of the American man which women can not well emulate.

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[1] Cooper, J. F. Notions of the Americans. London, 1828, Vol. I, p. 183.

[2] Weston, Richard. A Visit to the United States and Canada in 1833. Edinburgh, 1836, pp. 23, 28.

[3] Kercheval, Samuel. A History of the Valley (Shenandoah). Winchester, 1833, pp. 372, 373.

[4] Cuming, F. Sketches of a Tour to the Western Country, through the States of Ohio and Kentucky; etc. Pittsburgh, 1810, p. 30.

[5] Arusmont, F. W. d'. Views of Society and Manners in America: in a Series of Letters, etc., during the years 1818, 1819, and 1820. London, 1821, p. 429.

Several times the wild turkey enters the vernacular of this country. Who in his boyhood has not upon certain occasions had "to walk turkey?" Lieut. Abert gives another saying and its origin as he understands it.[1] "It is related that a white man and an Indian went hunting; and afterwards when they came to divide the spoils, the white man said, 'you may take the buzzard and I will take the turkey, or I will take the turkey and you may take the buzzard.' The Indian replied, 'you never once said turkey to me.'"

The chief claim of the turkey with the lay mind of the country is its place in the festivals of our United States. Both at Thanksgiving and at Christmas, it holds first place. In 1621, after the first harvest was gathered and it had proved a good yield, the early Pilgrims instituted a three day festival, the well known forerunner of our present Thanksgiving day. At this first feast,[2] "above all, they had the turkey, of which they found a 'great store' in the forest,....the turkey, thus early crowned queen of their bounty, and to which example their descendants, even though they may have failed to imitate them in other respects, have always been loyal." In fact,[3] "roast turkey, is the great event of the day. As roast beef and plum pudding are upon Christmas day in Old England, so is turkey upon Thanksgiving-day among the descendants of the puritans in New England."

Thus, we see how essential the wild turkey was to the explorer, how prominent a part of the larder it proved for the early pioneers and Indians, what sport it furnished our natives, settlers and foreign sportsmen, and how early it was singled out as our token of festival joy. Yet, why did we as a nation choose for a national emblem, a bird not necessarily indigenous and one which previously had and since has served as an insignium for other countries?

Several travellers (like Vigne, 1832, p. 213, Phillippo, 1859, p. 171) agree that Benjamin Franklin is right when he lodges his objection to the eagle and prefers the turkey as our national

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[1] Abert, Lieut. J. W. Notes of. Appendix No. 6 Ex. Doc. No. 41. Emory's Reconnoissance, etc. New York, 1848, pp. 501, 502.

[2] Love, W. D. The Fast and Thanksgiving Days of New England. Boston, and New York, 1895, p. 74.

[3] Mackay, Chas. Life and Liberty in America. New York, 1859, p. 65.

emblem. His argument is so sound and so clever that it will bear repeating:[1] "Others object to the *bald eagle* as looking too much a *dindon*, or turkey. For my own part, I wish the bald eagle had not been chosen as the representative of our country; he is a bird of bad moral character; he does not get his living honestly; you may have seen him perched on some dead tree, where, too lazy to fish for himself, he watches the labor of the fishing-hawk; and, when that diligent bird has at length taken a fish and is bearing it to his nest for the support of his mate and young ones, the bald eagle pursues him, and takes it from him. With all this injustice, he is never in good case; but, like those among men who live by sharping and robbing, he is generally poor, and often very lousy. Besides he is a rank coward; the little *kingbird*, not bigger than a sparrow, attacks him boldly and drives him out of the district. He is therefore by no means a proper emblem for the brave and honest Cincinnati of America, who have driven all the *kingbirds* from our country;.... I am, on this account, not displeased that the figure is not known as a bald eagle, but looks more like a turkey. For in truth, the turkey is in comparison a much more respectable bird, and withal a true original native of America. Eagles have been found in all countries, but the turkey was peculiar to ours; the first of the species seen in Europe, being brought to France by the Jesuits from Canada, and served up at the wedding table of Charles the Ninth. He is, besides (though a little vain and silly, it is true, but not a worse emblem for that) a bird of courage, and would not hesitate to attack a grenadier of the British guards, who should presume to invade his farmyard with a red coat on."

INTRODUCTION INTO EUROPE.

The first introduction of the turkey into Europe has always been a mooted and now rather hackneyed question somewhat remote from the intent of this paper. Almost every article on this subject has paraphrased Newton or Bennett or Beckmann or all, and we will content ourselves with the bare recital of their statements.

[1] Sparks, Jared. The Works of Benjamin Franklin. Boston, 1840, Vol. X, pp. 63, 64.

"Much labour has been given by various naturalists to ascertain the date of its introduction to Europe, to which we can at present only make an approximate attempt; but it is plain that evidence concurs to shew that the bird was established in Europe by 1530 — a very short time to have elapsed since it became known to the Spaniards, which could hardly have been before 1518, when Mexico was discovered. The possibility that it had been brought to England by Cabot or some of his successors earlier in the century is not to be overlooked, and reasons may be assigned for supposing that one of the breeds of English Turkeys may have had a northern origin; but the often-quoted distich first given in Baker's *Chronicle* (p. 298), asserting that Turkeys came into England in the same year — and that year by reputation 1524 — as carps, pickerels and other commodities, is wholly untrustworthy, for we know that both these fishes lived in this country long before, if indeed they were not indigenous to it. The earliest documentary evidence of its existence in England is a 'constitution' set forth by Cranmer in 1541, which Hearne first printed (Leland's *Collectanea*, ed. 2, vi. p. 38). This names 'Turkey-cocke' as one of 'the greater fowles' of which an ecclesiastic was to have 'but one dishe,' and its association with the Crane and Swan precludes the likelihood of any confusion of the Guinea-Fowl. Moreover the comparatively low price of the two Turkeys and four Turkey-chicks served at a feast of the serjeants-at-law in 1555 (Dugdale, *Origines*, p. 135) points to their having become by that time abundant, and indeed by 1573 Tusser bears witness to the part they had already begun to play in 'Christmas husbandlie fare.' In 1555 both sexes were characteristically figured by Belon (*Oyseaux*, p. 249), as was the cock by Gesner in the same year, and these are the earliest representations of the bird known to exist."[1]

Of its introduction on the continent, Bennett gives us the following:[2] "A Frenchman named Pierre Gilles has the credit of having first described the turkey in this quarter of the globe, in his additions to a Latin translation of Aelian, published by him in 1535. His description is so true to nature, as to have been almost wholly

[1] Newton, Alfred. A Dictionary of Birds. London, 1896, pp. 995, 996.

[2] Bennett, E. T. The Gardens and Menagerie of the Zoological Society Delineated Birds. London, 1835, Vol. II, pp. 213, 214.

relied on by every subsequent writer down to Willoughby. He speaks of it as a bird that he has seen; and he had not then been further from his native country than Venice; and states it to have been brought from the New World.

"That turkeys were known in France at this period is further proved by a passage in Champier's Treatise de Re Cibaria, published in 1560, and said to have been written thirty years before. This author also speaks of them as having been brought but a few years back from the newly discovered Indian islands. From this time forward their origin seems to have been entirely forgotten, and for the next two centuries we meet with little else in the writings of ornithologists concerning them, than an accumulation of citations from the ancients, which bear no manner of relation to them. In the year 1566 a present of twelve Turkeys was thought not unworthy of being offered by the municipality of Amiens to their king; at whose marriage, in 1570, Anderson states in his History of Commerce, but we know not on what authority, they were first eaten in France. Heresbach, as we have seen, asserts that they were introduced into Germany about 1530; and that a sumptuary law made at Venice in 1557, quoted by Zanoni, particularizes the tables at which they were permitted to be served.

"So ungrateful are mankind for the most important benefits, that not even a traditionary vestige remains of the men by whom, or the country from whence, this most useful bird was introduced into any European states. Little therefore is gained from its early history beyond the mere proof of the rapidity with which the process of domestication may sometimes be effected."

In many respects, Prof. John Beckmann [1] of Univ. of Gottingen, has given us one of the most exhaustive and best accounts of its introduction into Europe. He presents much of what is written in the two foregoing quotations and we select only such as supplement these.

"These testimonies (concerning their early discovery in America), in my opinion, are sufficiently strong and numerous to convince any naturalist that America is the native country of these fowls; but

[1] Beckmann, John. A History of Inventions and Discoveries. Transl. from German by Wm. Johnston. 2nd edit. corrected and enlarged. 4 vols. London. Vol. II, 1814, pp. 350–372.

their weight will be still increased if we add the accounts given us when and how they were gradually dispersed throughout other countries. Had they been brought from Asia or Africa some centuries ago, they must have been long common in Italy, and would have been carried thence over all Europe. We, however, do not find that they were known in that country before the discovery of America. It is certain that there were none of them there at the time when Peter Crescentio wrote; that is to say, in the thirteenth century; else he would not have omitted to mention them where he describes the method of rearing all domestic fowls, and even peacocks and partridges. The earliest account of them in Italy is contained in an ordinance issued by the magistrates of Venice, in 1557, for repressing luxury, and in which those tables at which they were allowed are particularised. About the year 1570 Bartolomeo Scappi, cook to Pope Pius V, gave in his book on cookery several receipts for dressing these expensive and much esteemed fowls. That they were scarce at this period appears from its being remarked that the first turkeys brought to Bologna were some that had been given as a present to the family of Buonocompagni, from which Gregory XII, who at that time filled the papal chair, was descended.

"That these fowls were not known in England in the beginning of the sixteenth century, is very probable; as they are not mentioned in the particular description of a grand entertainment given by the archbishop Nevil; nor in the regulations made by Henry VIII respecting his household, in which all fowls used in the royal kitchen are named. They were, however, introduced into that country about the above period; some say in the year 1524; others, in 1530; and some, in 1532....

"According to the account of some writers, turkeys must have been known much earlier in France: but in strict examination no proofs of this can be found. The earliest period assigned for their introduction into that country is given by Beguillet, who confidently asserts that they were brought to Dijon under the reign of Philip the Bold, about the year 1385.... De la Mare also is in an error when he relates that the first turkeys in France were those which Jaques Coeur, the well-known treasurer to Charles VII, brought with him from the Levant, and kept on his estate in Gati-

nois, after he had received the king's permission to return to the Kingdom. (before 1450 or 1456).... Equally false is the account given by Bouche in his History of Provence, that Rene, or Renatus, king of Naples and duke of Anjou, first brought turkeys into the kingdom, and reared them in abundance at Rosset.... The assertion, often repeated, but never indeed proved, that they were first brought to France by Philip de Chabot, admiral under Francis I, is much more probable. Chabot died in 1543; and what Scaliger says, that in 1540 some turkeys were still remaining in France, may be considered as alluding to the above circumstance. This much however is certain, that Gyllius, who died in 1555, gave soon after the first scientific description of them, which has been inserted both by Gesner and Aldrovandus in their works on ornithology. The same year the first figure of them was published by Belon. About the same time they were described also by La Bruyere-Champier, who expressly remarks that they had a few years before been brought to France from the Indian islands discovered by the Portuguese and the Spaniards. How then could Barrington assert that this Frenchman meant the East and not the West Indies! They must, however, have been a long time scarce in France; for, in the year 1566, when Charles IX passed through Amiens, the magistrates of that place did not disdain to send him, among other presents, twelve turkeys. This information seems to agree with the account often quoted, that the first turkeys were served up, as a great rarity, at the wedding dinner of that monarch in the year 1570; but it seems the breed of these fowls was not very common under Charles IX; for they are not named in the ordinances of 1563 and 1567, in which all other fowls are mentioned. In the year 1603, Henry IV caused higglers to be punished who carried away turkeys from the country villages without paying for them, under a pretence that they were for the use of the queen. I shall here also remark, that I can no where find that the Jesuits are entitled to the merit of having introduced these fowls into France.

"As these American fowls must have been carried to Germany through other lands, we cannot expect to find them in that country at an earlier period. Gesner, who published his Ornithology in 1555, seems not even to have seen them. We are, however, assured

by several authors, such as B. Heresbach (1595), Colerus (1611) and others, that turkeys were brought to Germany so early as 1530; and in the same year carried to Bohemia and Silesia. Respecting the northern countries, I know only, on the authority of Pontoppidan (1765), that they had been in Denmark two hundred years before his time.

"As these fowls are found at present both in Asia and Africa, it may be worth while to inquire at what period they were carried thither, especially as these quarters of the world have been by some considered as their native countries. In China there are no other turkeys than those which have been introduced from other parts, as we are expressly assured by Du Halde, though he erroneously adds that they were quite common in the East Indies. They were carried to Persia by the Armenians and other trading people, and to Batavia by the Dutch. In the time of Chardin they were so scarce in Persia that they were kept in the Emperor's menagerie. In the kingdom of Congo, on the Gold Coast, and at Senegal, there are none but those belonging to the European factories."

In addition to these accounts of its introduction into England and on the European continent, it might be apropos to present the very interesting hypothesis suggested by a naturalist of this continent, Prof. Baird. In 1858, he advances the following:[1]

"In conclusion I venture to suggest the following hypothesis, which, however, is not original with myself: That there are really three species of turkey, besides the *M. ocellata*, a fourth species from Central America, entirely different from the rest. That one of them, *M. americana*, is, probably, peculiar to the eastern half of North America; another, *M. mexicana*, belongs to Mexico, and extends along the table lands to the Rocky Mountains, the Gila, and the Llano estacado, and a third is the *M. gallopavo*, or domesticated bird. That it is not at all improbable that the last was originally indigenous to some one or more of the West India islands, whence it was transported as tamed to Mexico and other parts of America, and from Mexico taken to Europe about A. D. 1520. Finally, that the wild turkeys were probably completely exterminated by the natives, as has been the case with equally large birds in other islands, as the dodo and solitaire.

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[1] Baird, S. F. Rept. Pacific R. R. Routes, Vol. IX, 1858, Part II, pp. 613–618.

"This hypothesis will explain the fact of our meeting nowhere at the present day any wild turkeys resembling the domestic one. I have an indistinct recollection of a statement that our barnyard turkey came originally from Bermuda or Jamaica, but I cannot speak positively in regard to it.

"The entire subject is one of much interest, and deserves to be investigated thoroughly. It is quite possible that a careful examination of the external form and habits of the New Mexican bird may do much to throw full light on the whole question."

It is generally agreed that most of the domestic turkeys come from one or more of the Mexican forms (*Meleagris g. intermedia, merriami*), though the American (*M. g. silvestris*), Honduran (*M. ocellata*) and Floridan (*M. g. osceola*) forms may also have contributed. Other varieties of domestic nature may have arisen by recrossings of domestic breeds with the wild birds as has often been done to rejuvenate the stock. It is extremely unlikely that Baird's hypothesis of their origin from a West Indian form now extinct is tenable. Most of the early records of wild turkey in the West Indies are obviously of introduced forms. Oviedo's note of 1527 is of this nature, as is John Smith's note (1609) of a "store of turkees" in the Bermudas. In the latter region Richard Norwood asserts (1619) that "By this means (transportation) the Countrey was so replenished with Hennes and Turkeyes, within the space of three or foure yeeres, beeing neglected, many of them forsooke the Houses, and became wilde, and so lived in great abundance." In 1596, the Earl of Cumberland also finds in Porto Rico "some Turkies and Ginnyhens."

This theory of Prof. Baird postulates the former existence of a feral race of which no positive substantiating historical evidence is forthcoming. In the subsequent records, particularly from 1500–1600, possibly some additional light may be thrown on the question of introduction.

THE RECORDS FROM 1500–1600.

It seems best to reexamine some of the original sources of our early turkey history. The debatable evidence which may refer either to *Crax alector* and its allies or to *Meleagris* follows: Sebas-

tian Munster records that Petrus Alonsus in a voyage along the Venezuelan coast (about 1498) from the Gulf of Paria westward,[1] "In their woodes,....saw innumerable Peacockes, nothing unlyke oures, saving that the males differ litle from the females." Of this same region (1516) Pietro Martire of Anghiera writes (in his Second Decade) that the natives gave to *Vincentius Annez* and his men"[2] a great multitude of theyr peacockes, both cockes and hennes, deade and alyve, as well to satisfie theyr present necessitie, as also to cary with theym into Spayne for encrease." "In the marysshes also and fennes of the Regions of *Dariena*, are founde greate plentie of Pheasaunts and peacockes, (but not of variable coloures)...., in the rase of this large lande, *Colonus* (Columbus) hymselfe brought and sent to the courte a greate number of every kynde the which it was lawfull for all the people to beholde, and are yet dayly browght in lyke maner." The Pedro de Cieza de Leon note, often quoted from Pennant, in the original is:[3] "There are many turkeys....on the island" — not on the Isthmus of Darien, but on the Island of Gorgona, southwest of Buena Ventura, Colombia. In the "Narrative of the Proceedings of Pedrarias Davilla etc. written by Adelantado Pascualde Andagoya" we find that in Coiba and Cueva (in S. A. below Darien)[4] "they have no other game in these provinces excepting birds, of which there are two kinds of turkeys...." The translator, Sir. Clements R. Markham (1865) remarks in a footnote that "Turkeys are native of Mexico and do not come further south than Guatemala. The bird alluded to by Andagoya is probably a Curassow." In 1590, Father de Acosta publishes his "Natural and Moral History of the Indies."[5] He "wondered at hennes, seeing there were some at the Indies before the Spaniards came there, the which is well approved, for they have a proper name of the country, and they call a henne Hualpa, and the egge Ronto, and they use the same

[1] Eden, Richard. The First Three English Books on America (1511?–1555) Edited by Edward Arber. Birmingham, Eng., 1885, p. 36.

[2] ibid., pp. 129, 132.

[3] The Travels of Pedro de Cieza de Leon. A. D. 1532–1550. Translated by C. R. Markham, London, 1864, p. 21.

[4] Translated and edited by Clements R. Markham. London, Hakluyt Soc., 1865, pp. 17, 18.

[5] Acosta, Father Joseph de. The Natural and Moral History of the Indies. Seville, 1590. Reprinted from Eng. Translation of 1604, p. 276.

proverb wee doe, to call a coward a henne....: wee may conceive that a henne being so tame a fowle and so profitable, men might carry them with them when they passed from one place to another as we see at this day the Indians in their travel carry their henne with them or chicken, upon the burden they have on their shoulders: and likewise they carry them easily in their cages of reedes or wood."

These foregoing notes pertain to northern South American coasts and to the region from Darien southward. The average ornithologist would logically believe them applicable to curassows or guans, and no doubt this is the better interpretation. Still, the Wild Turkey was domesticated by the Aztecs before the discovery of America and it might have been distributed to the northern South American coasts and the West Indies by the Indian method described by Acosta. Furthermore, the Spanish introduction of the turkey into more interior provinces of South America may have been but an extension of the custom possibly begun about the Gulf of Mexico and the Caribbean Sea before the Spanish arrival. In this connection, the Inca G. de la Vega says,[1] "With the fowls and pigeons, that the Spaniards brought to Peru, came also the turkey of Mexico, which was not known before."

In the early days, as at later periods, the two types of bird were often confused and both were dubbed "Wild Turkey." As late as 1825, Schoolcraft writes,[2] "The Powhe or Crax alector of South America, which we have seen mounted in some of our museums under the name of 'Wild Turkey' is a bird belonging to a different genus in ornithology; and if alluded to, by the Scottish historian, (Robertson, Wm. The History of America) would have been mentioned by its popular name of *Indian hen.*"

We can now turn to the more certain records. According to Pietro Martire,[3] *Franciscus Fernandez of Corduba* Lupus Ocho and Christophorus Morantes seek new lands west of Cuba and come to Yucatan on its northern coast (1517). Here they find the natives are "accustomed to eate fleshe, and have great plentie

[1] The Royal Commentaries of the Yncas. By Ynca Garcilasso de la Vega. Transl. and Edit. by C. R. Markham. Hakluyt Soc. 1871, Vol. II, p. 485. (Orig. 1609–1617.)

[2] Schoolcraft, H. R. Travels in the Central Portions of the Mississippi Valley. [Performed in 1821.] New York, 1825, p. 71.

[3] Eden, Richard. p. 187.

of beastes and foules; as peacockes, and other whiche they francke and feede in their houses." In 1518, Grijalva visits Yucatan on its south coast and reports it [1] "hath also great plentie of foules..." In 1519, Cortez [2] send a side excursion to Yucatan and the natives bring "with them eight of their hennes beynge as bigge as peacockes, of brownyshe coloure, and not inferior to peacockes in pleasaunte tast." In his "Conquest of New Spain," Bernal Diaz del Castillo in writing of Montezuma's aviary mentions [3] "turkeys" among the "many sorts of birds and other things which are bred in this country." In his "Fifth Letter to Charles V," (1526) Cortez tells of coming suddenly on the natives who [4] "left behind many things, principally fowls,...," upon which they satisfy their hunger. And many writers have since held that Cortez must have sent turkeys among his numerous presents to his majesty.

Lopez de Gomara, in 1553, speaks of the turkey and holds that [5] "the gallipavo, of all the birds of New Spain, is the best for food. It is called this (gallipavo) on account of its resemblance in shape to the peacock (pavon) and to the domestic fowl (gallo). They are able to make the barb or wen on the head pass through considerable range of coloration." In his Historia de las Indias" he enumerates [6] "gallipavos" among the animals of Yucatan. Purchas, in his excerpts from Gomara's "Larger Relations of Mexico" gives us the following regarding Montezuma's aviary and menagerie: [7] "There were also other Cages for foule of rapine of all sorts, as Hawkes, Kites.... This house of foule had of daily allowance of five hundred Gynea cockes,...." "In the lower Halles were great Cages made of timber: in some of them were Lions, in others Tigres, in other Ounces,.... They were fed with their ordinary, as Ginea cockes, Deere...." In "The Voyage of Robert Tomson into Nova Hispania in the yeere 1555, etc." we find [8] "as for victuals

[1] Ibid., p. 188.
[2] Ibid., p. 193.
[3] Hakluyt Soc., Sec. Ser. XXIV, 1910, Vol. II, p. 61.
[4] Hakluyt Soc., 1868, p. 80.
[5] Gomara, Francisco Lopez de. Hist de Mexico, 1553, p. 343.
[6] ——, ——— Biblioteca de Autores Espanoles. Historiadores Primitivos de Indias. Tome Primero. Madrid, 1858, p. 181.
[7] Purchas His Pilgrimes. Vol. XV. Glasgow, 1906, pp. 536, 535.
[8] Hakluyt, Richard. Principal Navigation, etc. Hakl. Soc. Glasgow, 1904, Vol. IX, pp. 357, 342.

in the Said Citie (Mexico),....quailes, Guiny-cockes, and such like, all are very good cheape." Also in St. Domingo, "they have a good store of Guiny cocks and Guinyhens." In "a relation of the commodities of Nova Hispania" Henry Hawks, 1572 holds[1] "This city (Mexico) is very well provided....with....victuals, as....Guiny-cocks and hennes...." In the "History of the New World," Girolama Benzoni of Milan writes[2] "Two things are produced in this country which are not found elsewhere in India, except in the territories of *Guatimala*, of cape *Fonduri*, and *Mexico* and along the shores of *New Spain*. One is a species of peacock that has been brought to Europe, and commonly called the Indian fowls." In a footnote appears the following comment: "We call them *turkeys;* but in Italy they are still distinguished as galli d'India."

Eighteen years after the completion (1521) of the conquest of Mexico, explorations in northern Mexico and southwestern United States become pronounced. Purchas in "The Voyage of Frier Marco de Nica....into New Mexico and the adjoining lands, 1539-1595" says,[3] they "have....; great Guinee Cockes"; "A Letter of Francis Vazquez de Coronado....1539" remarks,[4] "the great store of Hennes of the Countrey." A relation (1540) of the same gentleman says,[5] "Wee founde heere Guinie cockes but fewe. The Indians tell mee in all these seven cities, that they eate them not, but that they keepe them onely for their feathers. I believe them not, for they are excellent good, and greater then those of Mexico." Of this same journey, Winship's translation gives more pertinent notes. Near Bernalillo,[6] "They (Indians) made a present of a large number of (turkey) cocks with very big wattles, etc." Again, "there are a great many native fowl in these provinces (among Tigeux Indians especially) and cocks with great hanging chins. When dead, these keep for sixty days, and longer in winter, without

[1] Hakluyt, R. Vol. IX, p. 380.
[2] Benzoni, G. Venice, 1572. Transl. W. H. Smith. Hakl. Soc. London, 1858, p. 148, 149.
[3] Hakluytus Posthumus or Purchas His Pilgrimes. Glasgow, 1905–1907. Hakl. Soc., Extra Series. Vol. XVIII, p. 54.
[4] Hakluyt, R. IX, p. 119.
[5] Ibid., p. 156.
[6] Winship, G. P. The Journey of Coronado 1540–1542. New York, 1904, pp. 40, 90, 99, 100, 153, 200.

losing their feathers or opening and without any bad smell." In another place we find the observation, "There are many fowls in the country tame." Also, in Cibola, "For foo they have.... some fowls, like those of Mexico, and they keep these more for their feathers than to eat, because they make long robes of them, since they do not have cotton." One other record for the same region comes forty years later, 1581–1583. The natives receive the travellers [1] "very courteously, and (bring) them to their townes, where....they (give) them....hennes of the countrey,..."

In Florida, De Soto in 1539 reports that [2] "They say, that there is to be found in it a great plenty of all the things mentioned, and fowles, guanojos* in yards,...." In the 1854 translation, Buckingham Smith gives "guanojos" as "Turkeys, in the language spoken by the natives of the Yucayo Islands."

In 1562, Captain John Ribault finds that [3] "As we passed thorow these woods (River of Port Royal) we saw nothing but Turkey cocks flying in the Forrests,...." In 1564, Laudonniere records that [4] "In this meane space the Indians visited me, and brought me dayly certaine presents, as Fish, Deere, Turki-cocks...." In 1586, Nicholas Burgoignon says [5] that they have there great store of Turkie cocks,...." The following year, 1587, "The description of the West Indies,...." relates of Florida that "The foules are Turkey-cocks,...." and that the Indians in the winter time feed on them as well as deer, fish and oysters. The same year 1587 in the same work [6] there appears a repetition of the Ribault note with the addition that these turkeys were in woods of oaks, cedars, and Lentiskes.

In 1601 Antonio de Herrara begins the publication of his 8 decades on "The General History of the Vast Continent and Islands of America, commonly called The West Indies." It treats of the period from 1492–1554; and in several places, he alludes to the turkey. Of Griljalva in Yucatan, he says [7] "They (Indians)

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[1] Hakluyt, R. Vol. IX, p. 194.

[2] Letter of Hernando de Soto in Florida etc. July 9, 1539, Washington, 1854, p. 9.

[3] Hakluyt, R. Vol. VIII, p. 461.

[4] Ibid., IX, p. 49.

[5] Ibid., IX, p. 114.

[6] Ibis, VIII, pp. 451, 456, 461.

[7] Herrara, Antonio de. 1725–1726 London, 3 vols. Translation by Capt. John Stevens, Vol. 2, pp. 126, 349, Vol. 3, p. 353; Vol. 4, pp. 19, 142.

immediately (sent to him) thirty Indians loaded with roast Fish, Hens,...." Concerning Montezuma's Aviary and Gardens, he asserts that "they (wild beasts) were fed with Turkeys, Deer..." Of the province of Tabasco, Mexico, he writes, "This country abounds in Turkies." Also of Yucatan, we find much the same assertion. "This country always abounded in Game, especially in Deer and wild Boars, and therefore the *Indians* call'd it *Ulunuluyz yetelzed*, that is Land of Deer and Turkey." In his last note of this form, he relates a custom of Honduras and Ybueras, "they ....kept the shells of Turkey Eggs that were hatch'd alledging, that if they were thrown away the Pouts would dye."

The first description of the Turkey is usually credited to Gonzalo Fernandez de Oviedo y de Valdes, who was at Darien from 1514–1517, 1519–1523, later at Cartagena, and in 1535 at Santo Domingo. He wrote "Historia natural y general de las Indias" in 50 books. The first volume (19 books) of this work was published at Seville in 1535, and a brief extract of his Sumario de la Natural Historia de la Indias appeared at Toledo in 1527. Most of the English translations apparently are of this 1527 extract which probably has not the turkey account. He treats both Curassows and Turkeys as Pavos (Peafowls).[1]

"There are some peafowls reddish (ruby) and others black, and the tails have the shape of the peahens of Spain; but in plumage and in color, some are entirely reddish (ruby), and the abdomen with a little of the breast white, and the others entirely black, and in the same manner the abdomen and part of the breast white; and both have upon the head a beautiful crest or tuft, of red feathers for the red ones, and black for the black ones, and they are better to eat than those of Spain. These peafowls are wild, and some are domesticated in the houses when they are taken young. The archers kill many of them because they are in great number. Some say that the pea-cock is red and the pea-hen black; others are of contrary opinion, and say that the pea-cock is black and the pea-hen reddish (ruby); others say that they are of two kinds (géneros) and that the male and female are of both colors and of

[1] Biblioteca de Autores Espanoles, etc. Historiadores Primitivos de Indias. Tome Premero. Sumario de la Natural Historia de las Indias, Capítulo XXXVI, p. 493. This excerpt transl. by A. J. Lamoureux.

either of them. If the archer does not hit it in the head or in a part that kills the said peafowl, though it be struck in a wing or other part, it goes on the ground afoot and runs rapidly; and as it is necessary that the archer have a good dog and quick, so that the hunter should not lose his labor and the game. One of these turkeys is valued a *ducat*, and sometimes a *castellano* or *peso de oro* (gold dollar), which is as much as it is to spend a *real* in Spain. Other peafowls larger and of better savor and more beautiful are found in New Spain (Mexico), of which many are carried to the islands (West Indies) and to Castilla del Oro (Darien), and they are bred domestically in the homes of the Christians; of these the females are plain and the males beautiful, and very often make a wheel (*hacen de rueda*), though they have not so great a tail nor so beautiful as those of Spain; but in all other respects as to their plumage they are very beautiful. They have the neck and head covered with a carnosity without feathers, which often changes to diverse colors, when it suits them, especially when they make the wheel it becomes very red, and when they stop making the turn sometimes yellow and other colors, and sometimes blackened, changing color dark and white, many times; and on its face above the beak the pea-cock has a short teat (pézoncorto), which when he makes the wheel is enlarged or grows more than a palm; and from the centre of the breast springs and is worn a lock of coarse hair as thick as a finger, and these hairs neither more or less than those of the tail of a horse, very black, and more than a palm long. The meat of these peafowls is very good, and incomparably better and more tender than that of the peafowl of Spain."

Another who has been frequently mentioned with Oviedo in the earlier turkey accounts is Franciscus Hernandez (Fernandez), whom Philip I sent to Mexico in 1570–1576. Only portions of his 16 folio work have appeared, and in 1651 (not between 1555–1598, as Pennant supposed) there appeared the tract on birds. Concerning Huexolotl (Turkey), he writes, "This is the Indian Fowl, which some call the Gallipavo, and with which all are acquainted; they are to be found in woods, are twice as large as the domestic ones, more hardy, and more unsavory, but in other respects similar to them. Sometimes they are slain with arrows, and at other times with real warlike weapons. And then there are

the females, called in the above language Cihuatotolin, which are smaller than the males: and although most acceptable and wholesome food, they are nevertheless it would seem to our countrymen, too moist, excessively oily, and nauseous to some delicate palates." [1]

In 1811, Alex. De Humboldt speaks of these last two authors and adds some interesting notes regarding the early history of the turkey of Mexico and the domestic one of Europe. He writes as follows: [2] "From Mexico, the Spaniards carried them into Peru, to Darien, and into the Antilles, where Oviedo described them in 1515. Hernandez has already very well observed that the wild turkey from Mexico are very much larger than the domestic turkies. At present, one only meets the wild ones in the northern provinces. They betake themselves to the north, as the population increases and as a necessary consequence when the forests become more rare.... When the English in 1584, arrived in Virginia, the turkeys already had existed fifty years in Spain, Italy, and England. This is not the first time this bird passed from the United States into Europe, as many naturalists have erroneously stated."

EARLY COMPARISONS OF THE FERAL AND DOMESTIC FORMS.

Early chroniclers, as we of the present, instinctively compare the wild form with the smaller domestic variety of the poultry yard; and the literature of North American travel is replete with such descriptions, some of which appear herewith because of their intrinsic interest and because of the sidelights they may throw on domestication and introduction into Europe.

In the French domains of North America, the Jesuits frequently note them. Allouez at Lake Poygan, Wisconsin (1669–70) says,[3] "there we saw two Turkeys perched on a tree, male and female, resembling perfectly those of France — the same size, the same

[1] Hernandez, Francisco. Nova plantarum, animalium et mineralium Mexicanorum historia — Romae 1651. Tractus Secundus. Cap. LIX, p. 27.

[2] Humboldt, Al. De. Essai Politique Sur Le Royaume De La Nouvelle-Espagne. 5 vols. Paris, Tome Troisieme, Livre IV, Chap. X, pp. 233, 234.

[3] Thwaites, R. G. The Jesuit Relations and Other Allied Documents. 1610–1791. Cleveland, 1896, Vol. LIV, p. 219.

color, and the same cry." Rasles in the Illinois country, 1723 records,[1] "we can hardly travel a league without meeting a prodigious multitude of Turkeys, which go in troops, sometimes to the number of 200. They are larger than those that are seen in France. I had the curiosity to weigh one of them, and it weighed thirty-six livres. They have a sort of hairy beard at the neck, which is half a foot long." Poisson at Bayogoulas on the Mississippi, 1727 writes that his host[2] "neglected nothing for our comfort; he regaled us with wild turkey (these are very like domestic turkeys but they have a better flavor)."

In the southern English colonies, we have a similar set of observations. According to Fiske,[3] "On that same voyage (Christopher Newport, carried home a coop of plump turkeys, the first that ever graced an English bill of fare."

Of the turkeys in Carolina John Lawson writes in 1714 as follows:[4] "There are great flocks of these in Carolina. I have seen about five hundred in a flock; some of them are very large. I never weighed any myself, but have been informed of one that weighed near sixty pound weight. I have seen half a turkey feed eight hungry men two meals. Sometimes the wild breed with the tame ones, which they reckon makes them very hardy, as I believe it must. I see no manner of difference betwixt the wild turkies and the tame ones; only the wild are ever of one color, viz: a dark gray or brown, and are excellent food. They feed on acorns, huckleberries, and many other sorts of berries that Carolina affords. The eggs taken from the nest and hatched under a hen will yet retain a wild nature, and commonly leave you and run wild at last, and will never be got into a house to roost but always perch on some high tree hard by the house, and separate themselves from the tame sort, although, at the same time, they tread and breed together. I have been informed that if you take these wild eggs when just on the point of being hatched, and dip them (for some little time) in a bowl of milk-warm water, it will take off their

[1] Ibid., Vol. LXVII, p. 169.
[2] Ibid., Vol. LXVII, p. 297.
[3] Fiske, John. Old Virginia and her Neighbors. Boston and New York, 1897, Vol. I, p. 122.
[4] Lawson, John. The History of Carolina, etc. London, 1714. Reprint, Raleigh, N. C., 1860, pp. 244, 245.

wild nature and make them as tame and domestic as the others. Some Indians have brought these wild breed, hatched at home, to be a decoy to bring others near their cabins, which they have shot."

In 1735, Francis Moore finds in Georgia [1] "Of wild fowl kind, there are wild turkeys, though but few of them upon the island (St. Simons), but plenty upon the main. This bird is larger than the tame turkey, and the cock is the beautifullest of the feathered kind; his head has the red and blue of the turkey, only much more lively and beautiful, his neck is like the cock pheasant's, his feathers also are of the same color with those of that bird, glittering in the sun as if they were gilded; his tail is as large, though it hath not so fine eyes in it as the peacock's hath. At first, before they were disturbed by our people, they would strut in the woods as a peacock does. I have heard some say, that upon weighing, they have found them to exceed thirty pounds; I never weighed any, but have had them very fat and large; they are delicious meat and are compared to a tame turkey, as a pheasant is to a fowl."

In Pennsylvania, Kalm (October, 1748) observes that [2] "The *Turkey Cocks* and *Hens* run about in the woods of this country, and differ in nothing from our tame ones, except in their superior size, and redder, though more palatable flesh. When their eggs are found in the wood, and put under tame *Turky* hens, the young ones become tame; however when they grow, it sometimes happens that they fly away; their wings are therefore commonly clipped, especially when young. But the tamed turkeys are commonly much more irascible, than those which are naturally tame. The Indians likewise employ themselves in taming and keeping them near their huts."

Shortly after the Revolution, the number of travellers in this country increases, and at the end of the eighteenth century and at the beginning of the nineteenth century, we have several pertinent notes. Among Bartram's numerous remarks on this species, we find that he when near Darian, on Altamaha River,[3] "saw here a

[1] Colls. Ga. Hist. Soc. Savannah, 1840, p. 117.

[2] Kalm, Peter. Travels into North America, etc. Translated by J. R. Forster. Vol. I, Warrington, 1770, p. 209.

[3] Bartram, William. Travels through North and South Carolina, Georgia, East and West Florida. Phila. 1791, p. 14.

remarkably large turkey of the native wild breed: his head was above three feet from the ground when he stood erect; he was a stately beautiful bird, of a very dark dusky brown colour, the tips of the feathers of his neck, breast, back and shoulders, edged with a copper colour, which in a certain exposure looked like burnished gold, and he seemed not insensible of the splendid appearance he made. He was reared from an egg, found in the forest, and hatched by a hen of the common domestic fowl.

"Our turkey of America is a very different species from the mileagris of Asia and Europe; they are nearly thrice their size and weight. I have seen several that have weighed between twenty and thirty pounds, and some have been killed that weighed near forty. They are taller, and have a much longer neck proportionally and likewise longer legs, and stand more erect; they are also very different in colour. Our's are all, male and female, of a dark brown colour, not having a black feather on them; but the male exceedingly splendid, with changeable colours. In other particulars they differ not."

The following year, 1792, Belknap in speaking of "*Meleagris gallopavo*" gives us the following:[1] "Dr. Goldsmith doubts whether any of this breed have been tamed in America. They certainly have been tamed; but they are degenerated in size by their domestication, scarcely any being more than half so heavy as those above mentioned. The turkey is a rambling bird, and runs with great speed on the ground. The tame flocks frequently wander, and cannot be fatted till the snow prevents their excursions." Priest three years later, 1795, holds the backwoodsmen and western settlers think[2] "The *only* bird....worthy of their attention is the wild turkey. An American naturalist (Bartram) says, 'Why do not the Americans domesticate this noble bird? They are much better adapted to bear this climate than the puny breed their ancestors imported from England. The few that are shot so far to the eastward as to be brought to our markets bear a great price.'"

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[1] Belknap, Jeremy. The History of New Hampshire. Boston, 1792, Vol. III, p. 170.

[2] Priest, Wm. Travels in the United States of America; commencing in the year 1793, and ending in 1797, etc. London, 1802, p. 90.

In connection with Heckewelder's journey to Wabash in 1792, his translator makes this note:[1] "Our tame European turkeys are descended from this wild species, which in the latter part of the 16th century had become known in Germany. They are found in large numbers in less inhabited regions, west of the middle free states. Schöpf saw them during his journey in great numbers running about in the woods, hiding in the brushes or setting on the limbs of trees. They distinguished themselves from the tame ones, by their uniformity of colors, being black, brown and muddy white spotted, they weigh 28–30 lbs." Parkinson, who travels in America in 1798–1800, in discussing the "Fowls of America" says,[2] "There are great numbers of turkeys reared; and very fine they are. There are likewise wild turkeys, which are something larger than the tame ones, but so like them, that I should be unable to distinguish the one from the other. They are black or rather brown, called copper colour." At the same time Michaux well known to American naturalists writes the following: [3] "To the east of the Mississippi, in a space more than eight hundred leagues, this is the only species of wild turkey which is met with. They are larger than those reared in our poultry-yards. In autumn and in winter they feed chiefly on chestnuts and acorns; and some of those killed at this season weigh thirty-five or forty pounds. The variety of domestic turkies, to which the name of English turkies is given, in France, came originally from this species of wild turkey; and when they are not crossed with the common species, they retain the primitive colour of their plumage, as well as that of their legs, which is a deep red. If, subsequent to 1525, our domestic Turkies were naturalized in Spain, and from thence introduced into the rest of Europe it is probable that they were originally from some of the more southern parts of America where there doubtless exists a species different from that of the United States."

In 1806, Priscilla Wakefield's "Excursions in America" appears. When at Sunbury below Savannah, the traveller comments on

[1] Penn. Mag. Hist. and Biog. Vol. XII, p. 166.

[2] Parkinson, Richard. A Tour in America in 1798, 1799 and 1800. London, 1805, Vol. I, pp. 299, 115.

[3] Michaux, F. A. Travels to the Westward of the Alleghany Mountains, in the States of Ohio, Kentucky and Tennessee, etc. undertaken in 1802.... Transl. by B. Lambert. London, 1805, pp. 217, 218.

the prodigious size of wild turkeys.[1] "I saw one, that had been hatched from an egg found in the forest: he was a noble, majestic bird, at least a yard high, when he stood upright; his colour was dark dusky brown; but the feathers of the neck, breast, back and shoulder, were tipped with copper colour, which in the sun looked like burnished gold. The American turkeys are twice as large as those we have in England, particularly as to height as their necks and legs are longer in proportion. Both the cock and the hen are brown, not having a black feather on them; but the cock is beautifully adorned with variable shades, as I have already mentioned." In 1810 Christian Schultz finds them common at the mouth of the Ohio. He writes,[2] "I likewise saw several broods of wild turkey, produced in a similar way: these are procured by placing the eggs, which are frequently found in the woods, under a hen or a tame turkey, and the brood become as much attached to the barnyard as if they had a claim to it by hereditary right. I shot several dozens of wild turkeys in descending the river, but could never discover the least difference betwixt them and those we have domesticated. They can scarcely be denominated wild, as we frequently passed within thirty yards of flocks which were drinking by the river, without their showing the least signs of alarm." At the Chickasaw bluff on the Mississippi River, Monteile (June 2, 1817) shoots a very fine wild turkey which proves excellent eating.[3] "Its fat was not confined to a particular part, as with our domesticated turkeys, but spread throughout the flesh, which renders it much more savoury; they are the same size as the latter, but more active. We had often seen them upon the banks, surrounded by eight or ten young ones; but on approaching, they fled to the forest; all of them appeared to be of a dark brown colour."

The famous Schoolcraft (1821) in his "Travels in the Central Portions of the Mississippi Valley" (N. Y., 1825, p. 71) remarks that "With regard to the (turkey), an opinion has been advanced,

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[1] Wakefield, Priscilla. Excursions in North America,.... London, 1806, pp. 84–87.

[2] Schultz, Christian. Travels on an Inland Voyage through the States of New York, Pennsylvania, Virginia, Ohio, Kentucky and Tennessee,.... New York, 2 vols., 1810, Vol. II, p. 19.

[3] Monteile, E. A Voyage to North America, and the West Indies, in 1817. London, 1821, p. 73.

that it is not indigenous to our country; but the assertion of Robertson on this subject, that this bird was one of those which Cortes found in a state of domestication, on his arrival in Mexico, would, it should seem, put to rest all dispute on this point,.... The gallipavo is, in fact, a bird peculiar to North America, and is found as a wild-fowl throughout all our forests, from Mexico to the Northern Lakes, without any material variation in its specific marks. It was unknown to the ancient writers on natural history, and unknown in Europe, before the discovery of America. Authors inform us that it was first seen in France, in the reign of Francis I, and in England, in the reign of Henry VIII. By comparing the epochs of these sovereigns it appears evident, that the first turkeys must have been brought from Mexico, the conquest of which was completed, A. D. 1521 — three hundred years antecendent to the date of the present remarks." The following year, 1822–23, William H. Blane, an English gentleman when a [1] "few miles from the village of Hancock (Md),.... put up a large 'gang' of wild turkies that was crossing the road. These birds, which I afterwards saw an immense number of in the Western States, are much larger and handsomer, as well as of a more stately gait, than tame turkies. Their colour is the same as that of the breed which we call the dark Norfolk. Their plumage is particularly fine, and has a beautiful gloss, very much resembling that of an English starling, and which immediately distinguishes them from the domestic varieties, even when dead. I may here mention that the turkey originally came from America, and was unknown to the ancients. Indeed it is now generally allowed by naturalists, that the *Meleagrides* of the Romans were Guinea Fowls."

In 1832, Flint writes of [2] "The wild turkey (as) a fine, large bird, of brilliant blackish plumage. It breeds with the domestic one; and when the latter is reared near the range of the former, it is sure to be enticed into the woods by it. In some places they are so numerous, as to be easily killed, beyond the wants of the people! We have seen more than a hundred driven from one

[1] An Excursion through the United States and Canada during the years 1822–23 by an English Gentleman (William H. Blane) London, 1804, p. 85.

[2] Flint, Timothy. The History and Geography of the Mississippi Valley. Two vols. (in one). Cincinnati, 1832. Vol. I, p. 73.

cornfield." About this same time, James Stuart in a journey from Montgomery to Mobile finds the [1] "wild turkey abounds in these (Chattahoochee River) woods, and when fat is an excellent bird: but as the wild turkeys are shot indiscriminately, they are often brought to table when they have not been sufficiently fed. I was always better pleased to see the tame than the wild turkey on the table." Finally, concerning the tame form, Zadock Thompson says in 1842, that [2] "The Domestic Turkey sprung from this species, and was sent from Mexico to Spain in the 16th century. It was introduced into England in 1524, and into France and other parts of Europe about the same time."

OSTEOLOGY OF THE PASSENGER PIGEON (*ECTOPISTES MIGRATORIUS*).

BY DR. R. W. SHUFELDT.

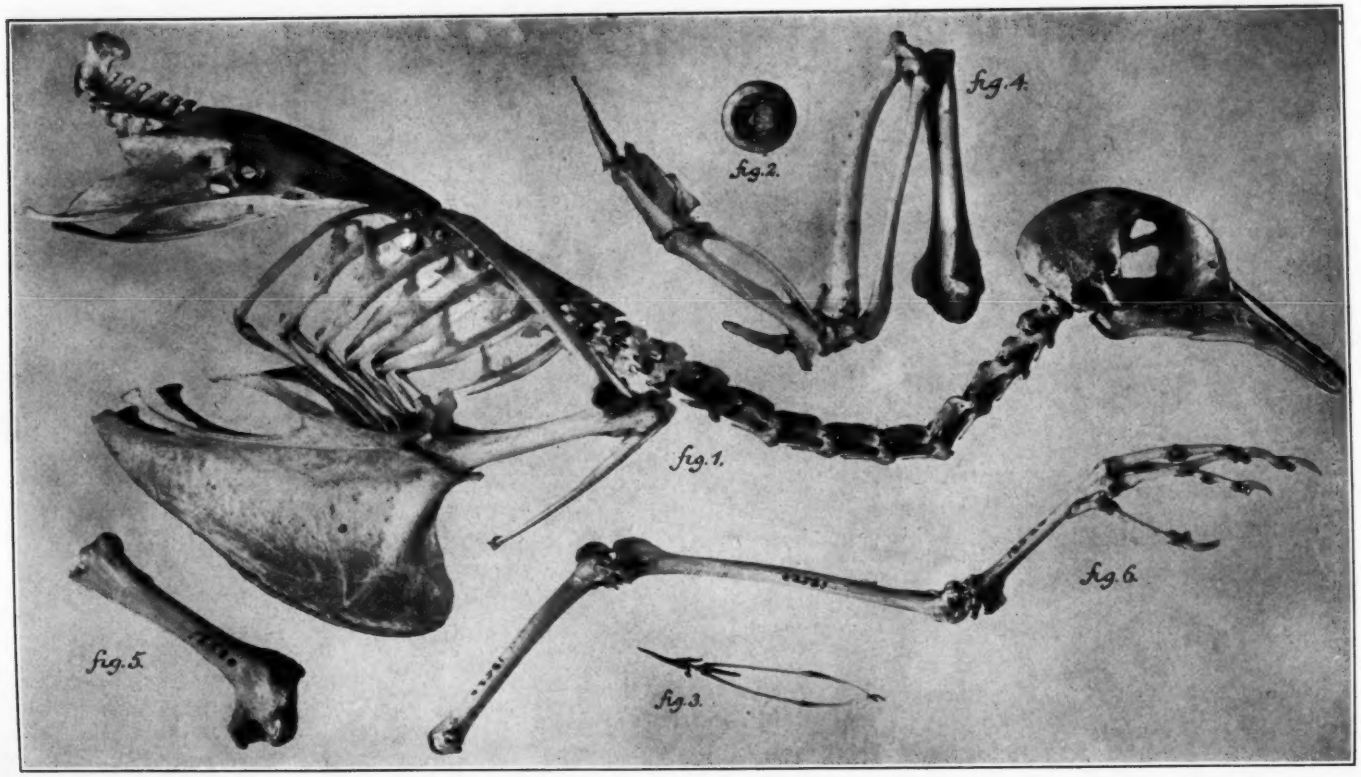
Plate XXXIV.

As far as I have been able to ascertain, there appears to be but one living specimen of *Ectopistes migratorius* in North America, and that one is a captive at the Zoölogical Garden of Cincinnati, Ohio, where, at the present writing, Mr. Stephan writes me it is doing well. When it dies, the species will be utterly extinct in this country, where formerly it existed in enormous flocks, often numbering many millions. Personally, I have witnessed but one flight of this pigeon, and that was early in the 70's at New Canaan, Connecticut, the second day of which I shot about fifty birds.

There has been no complete account published of the osteology of this bird, and certainly no good figures of its skeleton, though I

[1] Stuart, James. Three Years in North America. Edinburgh, 1833, Vol. II, p. 214.

[2] Thompson, Zadock. History of Vermont. Natural, Civil and Statistical. Burlington, p. 101.



OSTEOLOGY OF THE PASSENGER PIGEON, *Ectopistes migratorius*.

referred, in two or three of my earlier papers, to some of the characters of the latter in connection with the osteology of the American *Columbæ* generally.[1] It is highly important that such an account should be published with a plate presenting all the essential characters of the skeleton. This will be useful at the present time, not only for comparison with the osteology of existing species, but also to the palæornithologist, in the event of the discovery of the bones of this bird in the ages to come.

I am indebted to the U. S. National Museum for the loan of a complete skeleton of this species, the only one in the collection, and the only one of which I have any knowledge (No. 18520, ad., Laurel, Md., ♂. ?). In connection with this loan, and for the prompt transmittal of the material, I have pleasure in thanking Dr. Charles W. Richmond, Assistant Curator of the Division of Birds, and his aid, Mr. J. H. Riley.

The plate illustrating the present article is a reproduction of the photograph I made direct of the aforesaid skeleton; it presents the bones natural size and conveniently arranged for study and comparative measurements.

There is nothing peculiar in the skeleton of this species — indeed, it is about as typically a columbidine one as we would meet with anywhere; a glance at the plate will be sufficient to convince the avian osteologist of this fact.

The Skull: — As in all true pigeons and in many fowls, the entire area of the superior part of the skull is smooth, being more or less flat transversely in the frontal region, and uniformly convex from before, backwards, from the vertex of the cranium. Superiorly,

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[1] Shufeldt, R. W. "Notes on the Classification of the Pigeons." Amer. Nat., Feb. 1891, Vol. XXV, No. 290, pp. 157, 158.

—— —— "On the Comparative Osteology of the United States *Columbidæ*." P. Z. S., Lond., Mar. 3, 1891, pp. 194–196.

—— —— "On the Osteology of the Pigeons (*Columbæ*)." Jour. Morph., Vol. XVIII, No. 3, Bost., 1901, pp. 487–512. Pls. A, B. This paper is illustrated by four outline sketches, only one of which is devoted to *Ectopistes*, namely the pectoral aspect of the sternum.

—— —— "On Fossil Bird-Bones Obtained by Expeditions of the University of Pennsylvania from the Bone Caves of Tennessee." Amer. Nat., July 1897, pp. 645–650. On page 649 it is stated that 'The Passenger Pigeon is represented in the collection by subfossil bones from several adult individuals.' It is shown that some twelve or more specimens were found, and that the several bones differ in no way when compared with the corresponding ones of *Ectopistes* as the species existed in our avifauna years ago.

the margins of the large orbits are cultrate, while the posterior processes at lateral aspect of the brain-case, as the post-frontal and squamosal, are much reduced. *Basis cranii* is horizontally disposed, and the brain-case is of good capacity, while the rather high *foramen magnum* is of cordate outline, with the very small occipital condyle minutely notched posteriorly.

Large vacuities occur in the *interorbital septum*, as shown in Fig. 1 of the Plate, where, too, we are to observe the bulky *pars plana*, and the elongate, narrow, though capacious, external narial aperture.

The *superior mandible* is nearly straight, being gently decurved at its apex, and, as a whole, making an open angle with the slender, straight, zygomatic or infraorbital bar. A *lacrymal*, which is of good size, completely fuses with the pars plana in the adult.

A *vomer* appears to be absent, while the quadrates, the small pterygoids and the palatine structures are all as we find them in this group of birds generally — that is, in the typical and smaller varieties of the wild pigeons.

The *mandible* is of an acute V-shaped pattern and slender in its proportions, with a weak and short symphysis.

As to the *hyoidean arches*, they are as we find them in most pigeons, and not unlike those structures in certain of the smaller species of the tetraonine types, being slender and formed as shown in Fig. 3 of the Plate. As usual, the *glosso-hyal* is performed entirely in cartilage.

In Figure 2 the united *sclerotal plates* of an eye are shown; there are some 13 or 14 in either circlet, and they are shaped as we find them in other *Columbæ*.

The Trunk Skeleton: — Between the skull and the pelvis *Ectopistes* has eighteen vertebræ, while fourteen unite most solidly together to form the pelvic sacrum; finally, there are six in the caudal division of the vertebral column, and all beyond these last go to form the large, subtriangular *pygostyle*.

As in many fowls, the three leading dorsal vertebræ fuse to form one bone, and the *ribs* they support are connected with the sternum by costal ribs or hæmapophyses. This is also the case with the pair of ribs belonging to the last dorsal vertebra, the remaining ones being disposed as shown in Fig. 1 of the Plate.

Broad and somewhat shallow, the *pelvis* of the Passenger Pigeon is, nevertheless, capacious, and reminds one of this bone in some of the *Tetraonidæ*. Its sacral roof is a broad, lozenge-shaped one, in close contact with the ilium upon either side; but coössification does not take place at any point along the sutural line.

As we might expect in a bird of such powerful flight, the keel or carina of the *sternum* is very extensive, with its fore-part thick and strong. There is a pair of xiphoidal processes on either side, posteriorly, each having an expanded distal end as shown in Figure 1 of the Plate. Four *costal ribs* articulate with either costal border, and a minute manubrium is seen to project in front.

Powerful flight in this bird also accounts for the presence in its skeleton of a *scapular arch*, with its usual component bones large and strong. *Os furculum* is of a broad, U-shaped form with a minute hypocleidium below. Either *scapula* is enlarged posteriorly, the distal extremity being truncate from within, outwards. A *coracoid* is an unusually large, long bone for a bird of the size of this pigeon, and it is very strong and straight. The *os furculum* does not meet the scapula, on either side, in articulation, and the free ends of this arch are but slightly expanded.

The Limbs: — As we would naturally expect, the skeleton of the pectoral limb indicates great power of flight. The several bones, though short, are massive, and in close and extensive contact at their articulations.

The *humerus* is short and straight and the shaft correspondingly stout. Its radial crest is triangular in outline as shown in Fig. 5.

Radius of the antibrachium is also straight, while the massive *ulna* exhibits more or less curvature along its entire continuity (Fig. 4).

In extreme length the humerus measures 4.3 cms.; the ulna 7.55 cms., and the radius, as in the case of the humerus, 4.3 cms. All of these bones, which is also the case in the pelvic limb, do not quite come up to these measurements, owing to there having been a slight obliquity in the point of view as they were placed to be photographed. This could not be avoided, as the bones of the limbs are *articulated*, and I had no right to separate them. The *carpo-metacarpus* has an extreme length of 2.9 cms., as in the Plate. Comparatively speaking, the bones in the thigh, leg and tarsus are

long and more or less slender; their principal characters are seen in Fig. 6 of the Plate. The *fibula* is free, and it extends but two-thirds down the side of the nearly straight shaft of the *tibio-tarsus*. The latter presents distally in front the little 'osseous bridge,' spanning obliquely the groove for the tendons which pass there in life. With respect to their extreme lengths, the femur measures 3.95 cms.; the *tibio-tarsus* 5.5 cms., and the *tarso-metatarsus* 3.0 cms.

In a former paper I have presented the affinities of *Ectopistes migratorius*, and this will obviate the necessity of my touching upon this side of the subject in the present connection, which pretends to be but a brief sketch of this fine representative of the *Columbæ* which will shortly be extinct.

EXPLANATION OF PLATE.

(All figures natural size.)

Ectopistes migratorius. No. 18520. Collection U. S. National Museum. From a photograph by the author.

FIG. 1. Skull and trunk skeleton; right lateral view, with bones all *in situ*.

FIG. 2. Circlet of *sclerotal plates* of right eye, with the dried enclosing membranes of the globe attached behind.

FIG. 3. *Hyoid arches*, seen from below; the cornua are drawn together, and the glosso-hyal is in cartilage.

FIG. 4. Right pectoral limb, viewed upon its palmar aspect, with all the bones *in situ*.

FIG. 5. Left *humerus*, seen upon anconal aspect.

FIG. 6. Left *pelvic limb*, inner or measial aspect, with all the bones *in situ*. The osseous *patella* is minute and a calcaneal sesamoid of some size is to be seen above the hypotarsus.

NOTES ON THE LOUISIANA CLAPPER RAIL (*RALLUS CREPITANS SATURATUS*) IN TEXAS.

BY GEORGE FINLAY SIMMONS.

I. INTRODUCTION.

MY observations of the Louisiana Clapper Rail (*Rallus crepitans saturatus*) have been of particular interest to me; and, as it seems there is very little known of this race, it appears advisable to publish the results of these observations in connection with a review of the few published records of Clapper Rails from Texas, in order to work out the range of the bird in that state.

The Rails have always proved somewhat of a mystery, but I did not realize how little was known of the nesting habits of the family in general and of the Louisiana Clapper Rail in particular until I began to search for information on the subject. My observations by no means cover the complete life history of the bird, and they are here given merely in the hope that they will diffuse some light on the habits of a little known species.

I wish to acknowledge my grateful indebtedness to Mr. E. F. Pope of Colmesneil, Texas, for ready answers to my numerous inquiries and for his field notes regarding the species under consideration. Among the others who aided me I wish to mention Mr. R. E. Farley of Port Aransas, Texas, and Mr. John M. Prior of Corpus Christi, Texas.

II. PREVIOUS RECORDS.

The first record of the Clapper Rail in Texas is that of the late Mr. Geo. B. Sennett, who, in 1877 under the name *Rallus longirostris* Bodd.,[1] states that "A few of this species were seen about Galveston Bay only, and a single bird obtained. 3-♀-14.60×20.00×5.75 ×2.50. Feb. 28, Galveston." The first number is that of the

[1] Sennett, George B. Notes on the Ornithology of the Lower Rio Grande, from observations made during the season of 1877. Bull. U. S. Geol. Surv. Terr., IV, No. 1, 1878, p. 61.

specimen; the sign for sex follows; the next four numbers indicate respectively the length, extent of wings, length of wing and length of tail. Date and locality follow.

In making a disposition of two Texas specimens in 1889,[1] Mr. Sennett says: "Two specimens in my collection from Texas, strange as it may seem, are referable only to this form [*Rallus longirostris caribæus*]; moreover, nothing like it has been taken in Florida, which lies almost in direct line between Texas and the West Indies. There is nothing in this country nor in England as yet to show the forms of Clapper Rail prevailing along the immense line of coast extending between the United States and Cayenne, South America. As it is not the habit of these birds to migrate over great expanses of land or water, it would indicate that the Texas *caribæus* found its way thither along the southern coast of the Gulf of Mexico; therefore it would be only reasonable to expect that we shall find this form along the entire Gulf coast of Mexico and the eastern coast of Central America."

It is a well known fact that just before his death [2] Mr. Sennett was contemplating the writing of a book on Texas birds, and in his personal copy of the A. O. U. Check-List he marked the Texas records in a series of initials which show the authority for the record and in most cases the locality. In this index of records he referred all Texas records of Clapper Rails to *Rallus crepitans saturatus;* his records appear to be three in number: (1) The February 28, 1877, record from Galveston; (2) records of the species at Corpus Christi, Texas, during his stay there from April 1 to May 25, 1882; and (3) records of M. A. Frazar "Lower Rio Grande for G. B. Sennett from Jany. '80 to June 1881." By the term "Lower Rio Grande" he probably refers to Corpus Christi as well as to the vicinity of Brownsville, which is the way he used the term in several of his previous papers on birds.

Mr. Sennett, Capt. B. F. Goss, and Mr. John M. Prior composed the 1882 collecting party at Corpus Christi, and it was on this trip that one of the specimens of the so-called Caribbean Clapper Rail

[1] Sennett, George B. The Clapper Rails of the United States and West Indies compared with Rallus longirostris of South America. Auk, Vol. VI, 1889, No. 2, p. 164.

[2] March 18, 1900.

was collected; Mr. Prior tells me that the single specimen collected at Galveston in 1877 was the second specimen referred to by Mr. Sennett in his 1889 disposition. After publishing his revision of the Clapper Rails, and during the middle '90s, Mr. Sennett wrote Mr. Prior to pay particular attention to the Rails as he wished to go further into his disposition of the Texas specimens; evidently Mr. Sennett's death cut short further investigation along this line. As the reader will see, Mr. Sennett apparently ignored his disposition of the two Texas specimens of 1889, in later making his index of records.

In 1889,[1] Mr. J. A. Singley states under the name *R. l. caribæus* as follows: "Marshes near mouth of the Nueces River; only two taken. A West India form found in the United States only in Texas." No dates were given, but in another portion of the same paper he says that collections were made in that locality from March 20 to April 24 and from June 16 to 19, 1889. Mr. Singley evidently read Mr. Sennett's paper, hence the name.

So far as I can find these are the only published records of Texas specimens of Clapper Rails.

In the following pages I give heretofore unpublished records of the nests and eggs, as well as other data which would throw some light on the life history of the bird.

Skins of the Texas birds are being studied in connection with the other races of the genus by Mr. Harry C. Oberholser, ornithologist of the U. S. Biological Survey, who will, undoubtedly, in the near future make a revision of the forms of the Clapper Rail. Therefore, in my paper I have made no mention of plumage, measurements, or differentiating marks of specimens of the Louisiana Clapper Rail.

III. DISTRIBUTION.

My own observations have, for the most part, been made on the coast prairie southeast of Houston, in Harris County, Texas, and within a seven-mile radius of the court house in that city, this locality being about 25 miles from Galveston Bay and 50 miles

[1] Singley, J. A. List of Birds Observed at Corpus Christi and on the Lower Rio Grande. Texas Birds, Report of Texas Geol. Survey. Austin, 1893, p. 367.

from the Gulf of Mexico. Then, too, I have studied the birds in the marshes on Galveston Bay and in Galveston County.

Mr. E. F. Pope made numerous observations on Bolivar Peninsula, Galveston Bay, between July 26, 1911, and the latter part of March, 1913. In that year and a half he covered well the extensive marshes from the "Point" to a flag-station called Flake, eight miles up the peninsula. He found the rail to be a common, and at times abundant, resident of these marshes where it breeds.

According to Mr. R. E. Farley, the Louisiana Clapper Rail is resident and breeds on Harbor Island, a small island about three miles north of Port Aransas, Texas. Formerly abundant, now scarce, the birds have always been more common from April to October than in winter.

Mr. John M. Prior's notes refer mainly to the Harbor Island rails; on that island he, too, found the birds resident and breeding. He states that he found them more common in April, May and June than in winter. In addition to finding the rails on Harbor Island, he found them on the marshy flats surrounding Corpus Christi Bay and in the marshes of St. Joseph's Island.

On June 17, 1909, Dr. J. M. Carroll of Brownwood, Texas, made a trip to Harbor Island and found the rails breeding and abundant.

Mr. J. J. Carroll, now of Houston, after writing his paper on the birds of Refugio County, Texas,[1] noted the bird as a rare resident in the tall grass and tule marshes which skirt Copano and Mission Bays. No nests were found, but he felt pretty sure they nested; for on several occasions eggs were brought him which could have belonged to no other bird.

Prof. H. P. Attwater of Houston, while at Rockport, Aransas County, Texas, from 1891 to January 1894, noted Clapper Rails as common in and about the marshes on the mainland and on the small islands in that vicinity. When I questioned him about specimens of the birds, he referred to his journal and found the following note, the identification being by Captain C. E. Bendire: "1 Rail — young bird — ♀ — August 8, 1893, Rockport. *Rallus*

[1] Carroll, James J. Notes on the Birds of Refugio County, Texas. Auk, Vol. XVII, No. 4, Oct., 1900, pp. 337–348.

longirostris caribæus (?), identification uncertain." He was making a specialty of the mammals of that locality and could not spare the time during the nesting season to search for nests.

In his small collection at Galveston Mr. H. P. Nettleton has a mounted group of an adult and a half grown young of the Louisiana Clapper Rail, which he collected on Galveston Island in the summer of 1901. He says that the birds are found throughout the year in the marshes over Galveston Island, in localities where the marsh grass is tall enough to offer shelter.

Mr. Frank B. Armstrong of Brownsville, during his many years of active field work in the Lower Rio Grande of Texas, has never found the rails south of the flats of Corpus Christi Bay or along the coast of Mexico, even in winter, which goes to show that they apparently do not migrate, and that there is no connecting link between the birds in Texas and those of Central and South America.

Over sixty skins of this bird in the private museum of Col. John E. Thayer of Lancaster, Massachusetts, were collected by Mr. Armstrong about Corpus Christi Bay and on Harbor Island.

Thus we find the Louisiana Clapper Rail (*Rallus crepitans saturatus*) ranging in Texas from Louisiana to the marshes surrounding Corpus Christi Bay.

In the humid subdivision, or Austroriparian, of Lower Austral zone of eastern Texas, it ranges from the water's edge as far back in the semitropic or Gulf strip as the marshes extend — in some cases thirty-five miles or more from salt water. From the western edge of this humid subdivision in a southwesterly direction it is confined to the marshes in immediate proximity to the open salt water of the bays.

Throughout this range the bird is a permanent resident.

IV. HABITAT.

At the mention of the word "Rail," the thoughts immediately turn towards brackish, sedgy, tide-washed marshes, inhabited by water snakes, water birds and great numbers of crustaceans.

In just such places along the Texas coast do we find the Louisi-

ana Clapper Rail. But those marshes are only found along the shores; the marshes inland are much smaller and of course are not tide-washed.

The extensive marshes on Bolivar Peninsula cover a strip varying from a half mile to nearly a mile wide, all covered with tall marsh grass. This low marsh ground extends along the bay side of the peninsula from the "Point" to Flake. Numerous sluggish bayous cross this strip and connect with Galveston Bay; in places these bayous widen into small ponds or lagoons, the edges of which are thickly covered with tall, rank marsh grass.

A marshy bayou flows through Port Bolivar, on the "Point," to the bay, forming quite a pond near the bay shore. About three-quarters of a mile up from the mouth of the bayou it again widens into something of a pond or lagoon, known locally as "Horse Shoe Lake." The edges of both ponds are also thickly covered with tall, rank marsh grass.

Harbor Island, where Messrs. Farley, Prior and Carroll studied the Rails, has about twenty-five acres well covered with tall marsh grass and boggy with salt water, indeed a typical salt water marsh.

Vast marshes extend from Nueces Bay ten miles up the Nueces River. They are bordered by reeds and sedge, and dotted with numerous small ponds.

From the timber of the Brazos River bottoms northward and eastward along the coast is the low, nearly level coast prairie of Texas. The only vegetation of this prairie is the tall grass, usually burned brown by the hot summer sun and killed by the cold "northers" which sweep over Texas in winter; here and there a huisache (*Vachellia farnesiana*) and an occasional 'motte' of three or four scrubby oaks serve to break the monotony. A few slowly winding bayous cross this plain, but the water in them rarely ever flows; these bayous are generally skirted by timber, but many of them contain marshy spots overgrown with tall grass, reeds and sedge. At the mouths of these bayous the country is usually so flat and low that the water spreads over a considerable area, forming innumerable marshy flats and salt water marshes, where tall grass, reeds and sedge grow in abundance.

In winter large numbers of ducks and other water-fowl attract

the hunter, but in summer these marshes are abandoned to the rails, Mottled Ducks and Herons.

Further inland from the coast, throughout this strip of coast prairie, are numbers of shallow ponds overgrown with reeds and sedge, and spots where tall grass and reeds grow over several inches of water. The few persimmon trees that are found on this prairie grow in such wet spots and offer admirable nesting sites for numbers of the smaller birds of the locality.

My favorite spot for the Louisiana Clapper Rail is a small Red-winged Blackbird colony about six miles south of the court house in Houston, being a mere damp spot on the prairie covering about two acres, and overgrown with tall grass and sedge. Two small clumps of persimmon trees grow in this marsh, one at either end. About fifty yards east is a railroad track, which here runs southward for a short distance and then westward across Texas to San Antonio. Though trains rattle and snort past several times a day, the birds do not seem at all disturbed.

In the persimmon trees nest the Scissor-tailed Flycatcher, Kingbird, Orchard Oriole, Florida Red-wing and Western Mourning Dove, with more Red-wings and a nesting pair of Maryland Yellow-throats in the tall marsh grass. Though fully twenty-two miles from Galveston Bay and fifty miles from the Gulf of Mexico, this salt marsh might be termed a typical salt marsh, for here nested a pair of Texas Seaside Sparrows, and not a mile off to the south a nest of the Mottled Duck with eleven eggs was found in another such a marsh. The pestiferous Dwarf Cowbird completes the list of breeding birds of this marsh, for never a year passes but what the nest of the Orioles contains one or two eggs of this bird.

V. General Activities.

Throughout the coast region of Texas the Clapper Rails are known as "Marsh Hens," and are well known to the more experienced hunters as denizens of the marshes and rice fields. Even when common in a locality they are often overlooked on account of their secretive habits and reluctance to taking wing to escape danger.

When pursued they run swiftly through the grassy jungles and well-worn runways, nimble runners you must admit, running with outstretched neck and erect tail. Their nimbleness and ability to dodge pursuers reminds the Westerner of the actions of the Road-runner when surrounded on all sides by men. This way and that they dart, and disappear before the very eyes of the enemy, fading away into a small clump of the tall marsh grass.

They swim well, with neck erect and sitting high on the water; they do not swim fast, and when wounded and closely pursued they dive and hold to the marsh grass beneath the water, head downward, to keep from rising.

They take to wing when pursued only as a last resort. Their flight is slow and labored, and with dangling legs they soon drop back into cover. In fact, their flight is so slow and awkward that it would be difficult for any sort of marksman to miss them.

Doubtless the reader will be surprised that the Rail has ever been known to perch; indeed, I was more than surprised. On one occasion, in August 1912, I was surprised to see a Clapper Rail flap up out of the marsh and light on a flat-topped post of the barbed wire fence, where it remained for some few minutes, standing there on the small flat surface as unconcerned as if on its marshy home ground.

From November 20, 1912, to the latter part of March 1913, Mr. Pope encamped in a deserted two-story building located on the bay shore of Bolivar Peninsula, at a point almost due north of Flake. The front of the building was over water at mean tide, and was built on piles.

Within a stone's throw of the rear of this building was a cove with an unknown depth of silt which was often left bare after a blow from the north. Around the edges of this cove was a favorite haunt of the Rails and when the cove was left bare there were seldom less than a dozen to be seen almost any time wading about in the silt, and feeding.

Just across this cove was a stranded two-masted schooner, "The Two Brothers," which had dragged her anchors and stopped with her prow just in the edge of a bayou. By taking hold of a line which dangled from her bowsprit and walking one of the anchor chains he could cross the bayou, and this was his regular route

when he visited that part of the marsh. He says that he went that way at least a hundred times, and he does not think he ever crossed without seeing from one to six Rails scuttle under the after part of the schooner, which rested on the ground in the tall marsh grass.

When the wind was high enough to keep the mosquitoes from bothering, Mr. Pope would clamber on the deck of the schooner and remain motionless till the Rails came out to resume their feeding, which they would do in about five minutes, if he kept perfectly still.

Here I quote the following from his notes: "I knew their runways leading under the schooner, and by watching these I could see them creep out, very slowly and cautiously, turning their heads side ways to look up. If I so much as flicked an eyelid, they would dart back. Eventually, however, they became so tame that they took little notice of my presence.

"Some one has said that a Rail which is quite at ease is very different in appearance from one that is frightened or at all nervous. Here I had the chance of a life time to verify the above statement. When filled with apprehension or frightened, the bird changes from its normal plump form to one of slenderness, with lowered and extended head, while the tail twitches or jerks with nervousness at every step. At ease they assume easy graceful attitudes, with tail at rest and slightly drooped."

The game scent of the birds is not very strong. A bird dog will 'point' them, but when the scent is once lost it is not easily regained.

Ask a hunter if he knows the marsh hen. He will tell you that it is a bird "like a chicken, and when closely pursued it runs through the marsh like a rat."

From the 9th to the 27th of June, 1913, I was encamped at Seabrook, on the Bay shore in Harris County, and every day one or more Rails were seen in a small marsh near the bay shore. On one occasion I stood for some time with three companions and watched one of these birds on the edge of the sedge; the bird was standing on dry bare ground with the tall reeds at its back, and seemed not at all shy as we stood there forty yards away watching it. Finally one of the other campers threw a tomato can at the Rail and it darted back into the marsh.

VI. SOCIAL RELATIONSHIP.

Though not strictly gregarious, the birds to a great extent live in colonies.

During the breeding season on the Bolivar Peninsula Mr. Pope found that one locality in particular, near Flake, appeared more tenanted than other portions of the extensive marshes; there he found numbers of nests, scattered along the marshy edges of a small slough or bayou. Indeed, it might have been termed a scattered colony of nesting birds.

During late summer and early fall the families keep together; but at the beginning of cool weather there appears to be a general mixing and scattering of the individuals.

During winter the birds were seen almost every day in small groups in the marshes and around the edges of the coves near Flake. In the latter places Mr. Pope often observed as many as a dozen scattered along a short stretch of silt, wading about and feeding.

He says that "early in March the birds became very noisy, especially late in the afternoon and about dusk. At this time the birds appeared to congregate in flocks of from four to eight, preparatory to mating; by the first of April the first pairs were observed."

The twenty-five acre marsh on Harbor Island was especially noteworthy for its abundance of Rails. So abundant were they that on three collecting trips at various times Mr. Armstrong secured about one hundred and fifty specimens.

On his trip to this marsh in June 1909, Dr. Carroll examined six or eight sets during the day. Besides this there were nests with incomplete sets and nests with young. In the one day he could not have covered the marsh thoroughly and probably missed numbers of nests.

The two-acre marshy spot just south of Houston contained two nests, less than a hundred yards apart.

VII. BREEDING HABITS.

Nesting Period.— On Bolivar Peninsula the birds were mating during March, the first pairs being seen about the first of April. After that the birds were all apparently mated; but, though the

marshes were carefully searched, no nests were found until the 15th of that month. The first eggs were found in the nests on the next trip, April 26 (1912), one nest containing four and another five. So that the first egg must have been laid about the 20th of April.

These two sets were later destroyed by some small mammal before they were complete and Mr. Pope did not have an opportunity to learn at what date the birds first began setting.

For the first brood, fresh eggs were found in the nests up to the middle of May. The first young were observed on the 26th of that month, already out of the nest and running around, though evidently newly hatched.

The first egg at Houston was noted on April 17, but that was unusual, for the dates in that vicinity are practically the same as those at Bolivar. One nest of eggs at Houston was pipped and hatching on May 27, while still another nest had already yielded its quota of young by the 31st of that month. No second broods were noted at either Houston or on Bolivar Peninsula.

On Harbor Island nests were found on the 15th of April, and the first eggs were noted on the 20th. When Dr. Carroll made his visit to the marsh on June 17, 1909, the birds had just started on their second nesting; nests with both full and incomplete sets were found. Mr. Farley says that he thinks the birds sometimes lay a third set, as he has found eggs as late as the last of August.

Nesting Data.— My best descriptions of the nests of this bird are contained in my journal for May 27, 1912, and I quote as follows:

"I entered the Red-wing colony about 10:00 A. M. and began a search for nests of the birds which I usually found breeding there. The ground was cracked and hard, the marsh being no longer a marsh, and the vegetation was burned brownish buff by the hot summer sun. The two small clumps of persimmon trees at either end of the marsh were the only groups of timber for miles, and offered the only shade to be found. The thermometer was ranging about 89° and I wondered how marsh-loving birds like the Red-wings could stand the heat and lack of water.

"While beating around in the tall grass near the center of the marsh I nearly stepped on what I at first took to be a nest of

Gallinule eggs, but which on closer inspection proved somewhat different from any Gallinule eggs I had ever seen; I was indeed puzzled to make out what they were. The nest was built of flags and long marsh grass of the same hue as the eggs (brownish buffy), and was built up solid from the ground about seven inches in a green clump of the tall marsh grass which in some manner had withstood the heat of the summer sun. There were four dirty, cracked eggs in the nest, a few pieces of shell on the ground, and about ten feet away was a dead young bird half out of the shell. I picked the latter up to examine it, but dropped it immediately to take a firm hold on my nose and return to the nest, more interesting to me just then. Taking the four eggs up one at a time and placing them to my ear, I listened and heard in two of them faint squeaks like the note emitted by a newly hatched domestic chick. On the ground about the nest and in the nest were a few small breast feathers which attracted my attention by their oddity. Each feather was brown on the tip for a half inch, the remainder of the feather being of an ashy hue. A typical water bird feather, each vein being separate and apart from the next vein, and not joined as in a quill. They certainly were not Gallinule feathers; what were they?

"Still puzzled as to what bird the nest might belong, and not once thinking of the rails which I had seen feeding in the vicinity on previous trips, I went on west across the tract to where the second clump of persimmon trees grew about a hundred yards away. A barbed-wire fence separated the two clumps, running diagonally across the marsh.

"About twenty feet away from the nearest persimmon tree in the second clump and still about ten feet from the fence, I flushed a large, brown, and slow-flying bird which I saw at once was a Louisiana Clapper Rail. Flying about a hundred yards, she (for I took it to be the female) lit in the tall grass without uttering a sound. After following her flight with my eyes I turned my attention to the ground from whence she flew and saw a nest similar to the one containing the four eggs. This nest, however, contained eleven eggs, duplicates of the first four but having a much cleaner and fresher appearance. The nest was a mass of material ten inches high, cunningly concealed in a tall clump of the high marsh grass, and built of the same material as nest No. 1.

"Leaving this nest I circled towards the spot where the Rail had disappeared, but though I searched for some time I was unable to find her. I then went on east to the railroad, after having been in the marsh about a half hour, and continued on my day's trip.

"On my way home I stopped at the Red-wing colony again to try and get a look at the Rail on the nest. Slowly I drew nearer and nearer to the nest, but I could not tell whether there was a bird on it or not, so still did she sit and so perfectly did she blend into the background that I was unable to see her until I was within about three feet of the nest.

"Sitting on one heel while using the opposite knee as an improvised table, I checked down a few descriptive notes and sketches in my note book, although I feared she would leave the nest while I was doing so. However, she did not, but remained on the nest eyeing me ascant, her slightly curved bill nearly sidewise to me. Dropping my note book and other paraphernalia, I arose until I was half over the bird on the nest; I could easily have caught her and might have stroked her as she sat on the nest, had I not been so slow. But as I remained in that position for several minutes without moving, she began to get nervous, and while I stood there watching her she stepped off the nest into a well defined little runway or path leading away from it. So slowly did she go and such time did she take to lift her feet at each step that I could have counted a second or two between each stride. About twelve feet away she stopped and half turned to watch me as I examined the nest and eggs.

"The nest was eight and a half inches across the top from rim to rim; the cavity was two and a quarter inches deep, being a gradual slope from rim to rim, with the reeds firmly and smoothly packed inside. For the most part the nest was composed of reeds and fragments of reeds or marsh grass from one inch to over a foot in length; a few were somewhat longer, being the standing blades of grass which had been bent flat against the ground and folded back again. The lining was of small fragments of the same buffy, broad-bladed marsh grass, and packed flat against the body of the nest.

"The majority of the eggs were cracked and pipped and the young in them kept up a constant twittering and faint squeaking, and continually stuck the tips of their bills through the small

openings they had made; in the morning none of the eggs had been pipped and I had had no idea how near the eggs were to hatching. Luckily I carried a pocket set of instruments which included an egg measure, and hence I was able to take the measurements of this set before proceeding with further investigation.

"Taking one of the eggs in my hand I enlarged the opening with the point of my pencil, with which help the young bird emerged. This newly hatched chick had black feet and a black body, with the exception of the stomach and rectum which were a rich orange-pink or salmon color; as is the case with all newly hatched water birds it was almost all feet. All the while it kept up a constant, but very faint twitter, punctuated now and then with a tiny *cheap*, reminding me, as stated before, of a domestic chick. Its feet and toe nails were black, as was its bill with the exception of a small spot over each nostril and at the tip; the spots over the nostrils were a dirty china white, while the tip of the bill was a dirty white with a faint pinkish tinge. The pip on the tip of the upper mandible was a brilliant china white. The down was still wet and clung to the bird's body in places; it was long and black, and very coarse and straight, resembling black horse hair. Ten of the eggs were pipped so I opened each in its turn, the healthy young in each case being taken out and placed with the others on the nest.

"In each case the bird's head was tucked under the right wing with the tips of the mandibles or pip coming up by the side of the flank directly under the section of the egg usually covered with a wreath of spots, nearer the larger end of the egg, but from the scant markings on the eggs and their being somewhat scattered over the whole of the surface it was difficult to locate even an apparent wreath. Every young came out of the egg with its eyes open although it had entered the world prematurely.

When I held up the eleventh egg, uncracked, to the sun it was as clear as could be, so I packed it away to be blown when I reached home. It was infertile, but in perfect condition.

"While I was examining the nest and eggs the parent bird now and then uttered a note which sounded like the *keck* of the Red-winged Blackbird, and several times I looked up to find her within four or five feet of me as I squatted by the nest, her long bill and bright eyes pointing my way through the blades of grass.

"The eggs in the first nest I packed away, for on my return no sounds were coming from them, and a little later, on opening the eggs, I found the young in them to be stiff and dead in the shells."

As soon as the young are dry they leave the nest, sometimes within a few hours after they are hatched. When about ten days old the black begins to shade to brown, the feathers peeping out amid the down. By the time they are half as large as the adults they are apparently fully fledged.

May 31, 1913, I visited the locality mentioned above in company with Mr. R. A. Sell, a naturalist friend of Houston, and we located a nest from which the young had already gone. There were several half shells in the nest, and by following the runways through the tall grass we found several more shells about ten feet away and one fragment at a distance of twenty feet or more, which leads me to believe that the parents help the young out of the shell and carry the shells away as fast as they are cast off. By the time the last three or four eggs are hatching the first young are dry and out of the nest, thus keeping the parent busy so that she is unable to help the last few youngsters.

From Mr. Pope's voluminous notes I quote the following references to nests and eggs: "April 15th I again sallied forth in quest of nests and on this trip was rewarded by finding two nests evidently just completed but without eggs. Both nests were in the thick marsh grass near bayous and were located by flushing the birds. The nests were of marsh grass blades, which were the only available material in the vicinity, and were placed in the middle of thick clumps of the same grass. The first nest was a rather flat affair, about ten inches across with the inside depth of about three inches; the second was elevated some ten inches in the middle of a clump of marsh grass that was very thick, completely hiding the nest so that it could not be seen except by looking down through the tops of the grass. These two nests were not more than a hundred yards apart. All around the nests were numerous well-beaten paths which the birds used.

"April 26th I again visited the two nests; nest No. 1 contained one broken egg, while on the ground nearby lay three more, also broken, which had the appearance of having been sucked. The work was credited to a raccoon as tracks of this animal were in

evidence in the immediate vicinity of the nest. Nest No. 2 contained five fresh eggs, which were later destroyed by some animal, either raccoon, mink or opossum, as tracks of all three animals were in evidence. The eggs were so badly broken up that I could not ascertain how many the nest contained when robbed, as I did not visit it again until May 2nd.

"On May 2nd a new nest was discovered, about two hundred yards from the above site. It was on the same bayou as the two last described nests and was built of marsh grass blades, on the ground amid thick grass stems, and contained two fresh eggs.

"On May 9th I took a set of ten eggs from this last nest. The majority of the eggs were fresh while a few showed signs of incubation. On this date two more nests were located, the first containing a set of eight eggs, incubation about one-fifth; nest of marsh grass blades in slight hollow in thick marsh grass on bank of bayou. This nest was of rather poor structure as compared with some others found, being quite flat and rather loosely put together, what there was of it.

"May 12th, my wife found nest on bank of pond near the Point. It was in thick marsh grass and composed of dry blades of marsh grass, built up about eight inches. It contained one egg, which three days later was found lying on the ground about two feet from the nest and broken in the manner of the others mentioned previously.

"May 15th I found a nest with seven fresh eggs; visited the nest on the 18th to find it deserted and no sign of eggs.

"May 26th the first young were observed, as they crossed a small open glade among weeds and bushes growing near the concrete wall of the Fort Crockett reservation, which is situated near the extreme point of the peninsula. There appeared to be at least eight young in this lot, and they were quite black and quite lively, easily evading my attempts to catch them. At later dates at least four other flocks of young in different stages of development were observed, but I never was able to secure any of the young."

Mr. Farley says that the nests in the vicinity of Harbor Island consist of reeds and tall marsh grass, and frequently the reeds and tall grass surrounding the nest are drawn together as though the tops had been platted or tangled so as to make a snug shelter from rain and sun.

The number of eggs per set in that locality varies greatly, as he has found the birds brooding on from four to thirteen eggs. He says that the period of incubation covers about twelve or fourteen days.

The Eggs.— The four eggs in Nest No. 1 of May 27, 1912, south of Houston, were cracked and pipped, but measured as follows: 1.68×1.24; 1.69×1.24; 1.68×1.24; and 1.67×1.23 inches.

The eleven eggs in nest No. 2 of the same date measured: 1.68 ×1.24; 1.69×1.24; 1.68×1.24; 1.68×1.23; 1.69×1.25; 1.68× 1.24; 1.68×1.24; 1.68×1.23; 1.67×1.24; 1.68×1.25; and 1.69 ×1.24 inches. In shape they were considerably like the eggs of the Gallinules, and were of a decided buff tint, a color that might be described as light brownish buff, and were speckled and spotted sparingly with different shades of brown and cinnamon and a few tiny specks of lavender, most of the larger spots being scattered around the largest circumference of the egg; some of the eggs, however, had not the least perceptible wreath.

The set of eight eggs collected by Mr. Pope and referred to in the foregoing notes under date of May 9, 1912, is now in the writer's cabinet. The eggs are very irregular in both size and shape, measuring: 1.76×1.23; 1.73×1.20; 1.83×1.22; 1.79× 1.22; 1.71×1.20; 1.76×1.22; 1.81×1.20; and 1.82×1.20 inches. They vary in coloration from almost white to faint buff, with the larger markings in the form of a wreath nearly at the extremity of the larger end of the egg; these markings consist of small splotches, spots, specks and streaks of cinnamon and reddish brown, and a few clouded spots of light lavender. Some of the spots were underneath the outer layer of lime of the shell, which is of a rather smooth texture. Several of the eggs have a few small protuberances rising from the shell, resembling tiny warts. These eggs are much longer and narrower than the set described from nest No. 2.

The set of ten eggs collected by Mr. Pope on the same day as the last mentioned set (May 9) is of a trifle richer coloration than the set of eight, but otherwise does not vary to any appreciable extent.

On June 17, 1909, Dr. Carroll examined numbers of nests in the Harbor Island marsh, each nest containing from seven to ten eggs.

The eggs varied from "quite pale with large markings to beautifully marked specimens with large and small markings and quite dark."

VIII. VOICE.

The voice of the Clapper Rail is peculiar indeed, its loud, harsh cackling resembling that of a Guinea fowl or the sound produced by some automatic toys. This harsh cackling might be likened to the sound of: *chack-chack-chack-chack-chack-chack-chack-chack*, rapidly repeated. This call is usually heard about the break of day and again about dusk; sometimes, however, it is heard during the day time or at night, though rarely.

On Bolivar Peninsula Mr. Pope says that he could always tell when a "norther" was due by the clatter of the Rails, as they invariably heralded its approach several hours before its arrival.

During the mating season in March, at which time they congregate in small flocks, Mr. Pope says that the birds became very noisy, especially late in the afternoon and about dusk. At the start of the nesting season, however, they quieted down.

While I was examining nest No. 2 the parent bird now and then uttered a note which resembled the *keck* of the Red-winged Blackbird.

At times during the early part of the breeding season I have stopped to watch adult Rails which appeared very ill at ease. The note uttered under these conditions is a hoarse grunting noise sounding like *bruck* or *gruck*.

The newly hatched young have a constant, but very faint twitter, and a note reminding me, as stated before, of the *cheap* of a tiny domestic chick.

IX. FOOD.

The food of the Clapper Rails consists of small crabs, slugs, snails, aquatic insects, grasshoppers, and occasionally a few seeds.

Mr. Farley writes me that the food of the Rails in the vicinity of Harbor Island consists of "insects and shells, which they find in the marsh, and the moss of the salt beach."

Mr. Pope's notes on the food and feeding habits are especially

interesting. He found that the best time to make observations on the feeding habits was shortly after a "norther," which blew a great deal of water out of the bay into the Gulf, thus causing low water in the bayous and sloughs which ran into the bay. At such times the Rails would wade out in the mud and silt where the water had receded, to gather the small crustacea (minute crabs, etc.) left stranded.

He says that "At one point I squatted on my heels and remained stationary for a few moments and was rewarded by seeing a Rail walk out of the grass into the mud and begin feeding, which it did by thrusting its bill into the soft mud and feeling around and stirring its food to the top, now and then securing a shrimp or small minnow. I was advised by an old fisherman who lives on the bay shore about three miles from Flake, that he had often seen these birds feeding on young Diamond-backed Terrapin, which were once quite plentiful in this part of the bay and which deposited their eggs in the shell banks along the shore, the eggs hatching and the young taking to the adjacent marsh and bayous, probably to escape their numerous enemies in the bay. There they fell before the Rails."

The contents of the stomachs of six of the birds secured on a trip to the marshes on October 12, 1911, were mostly shrimp, minnows, a few water bugs and slugs, and two had fragments of small crabs.

From the deck of the schooner, "The Two Brothers," mentioned previously as being near Flake, on Bolivar Peninsula, Mr. Pope had an excellent opportunity to watch the Rails feeding. He says: "On warm days the 'fiddler' or fighting crabs would crawl out of their holes around the old schooner and were eagerly devoured by the Rails. After catching one of the crabs they would usually remove the large claw before swallowing the victim. This was often accomplished with the assistance of a neighbor who would hold the crab in his beak while the other wrenched off the objectionable limb; but this method was not always satisfactory to the bird that removed the claw, as the one that held the crab usually proceeded to bolt it while the other was left to hold the claw, or rather to drop it. On one occasion when the crabs were not plentiful, a Rail found and tackled an unusually large 'fiddler,' which it mauled around in the mud for some time without apparent effect.

Suddenly, as if getting an idea, it left the crab and disappeared on the other side of the schooner, to return a moment later with a companion, the two soon disarming Mr. Crab. Now, I presume the same Rail came back; they are so much alike it is impossible to tell one from the other under such conditions, but from the way the birds went straight to the spot where the crab was left, I did not doubt the bird in the lead being the one that found the crab. Which one got the crab I cannot say, as after scuffling over him, they disappeared from my sight in the tall grass."

Though chiefly carnivorous, subsisting as they do on small univalve shell-fish and crustacea, the Rails never probe the mud like snipe, nor strain it as do the ducks. The food they gather is always in view and never secured from deep in the mud or silt.

Near Houston, inland from the seaside marshes, the food of the Rails is chiefly the small snail forms so abundant in the marshes.

X. FATALITIES.

Once common, the birds are rapidly becoming scarce. If protection is not afforded them at once they will soon be wiped out entirely. Hunters kill numbers of them during the hunting season. In fact, it is one of the easiest of the water birds to secure on the wing, and therefore is one of the first to be shot by the amateur marksman.

Mr. Pope observed that numbers of them fell victims to steel traps which he had set in the pathways of the mink in the marshes near Flake. These Rails caught in the traps were usually devoured by mink if caught in the night, and most of those caught were taken then.

The majority of the nests located by Mr. Pope in the Bolivar marshes in 1912 were usually found destroyed before the sets of eggs were complete, probably by mink, raccoon or opossum, as tracks of these animals were in evidence in the immediate vicinity of the several nests. The eggs remaining in the nests or on the ground nearby had the appearance of having been sucked. On Harbor Island Mr. Farley found that the Rails were comparatively safe from such enemies, there being no raccoons or other small

animals there to disturb them. Both Mr. Farley and Mr. Prior commented on the large number killed by hunters and dogs, and stated that some of the negroes consider the birds quite a palatable delicacy and gather numbers for the pot.

The Harbor Island Rails face extinction at this very time. A railroad has been built to the island from the mainland and improvements are being made. In addition to this the birds have been almost wiped out by collecting.

Probably the greatest factor the Rails have to contend with in their fight for existence is the flooding of the marshes, both from high tide and from heavy rains. At such times the birds are much exposed and bewildered and many drown. In the seaside marshes they build their nests on the banks of the sloughs or bayous instead of the higher parts of the marsh, and in rainy spells numbers of nests are destroyed.

They are naturally very delicate birds and sensitive to the cold of the more severe winters; many freeze to death where they are unable to secure shelter.

During November and December 1913 Texas was visited by one of the most destructive floods of its history, two of the largest rivers of the state rising and overflowing miles and miles of the lowlands towards the coast. During that time numbers of the Rails left the marshes and took to higher ground until the waters receded. One of these birds was caught in a bewildered condition in Mr. Farley's yard in Port Aransas in October.

XI. WINTER.

Most of the winter habits of the birds have been given in the two preceding divisions of this paper.

In the colder weather they haunt drifts of logs or trash in the marshes, where they take shelter from the cold north wind and from rains. But as the thermometer rarely falls below freezing in this semitropical coast country, the birds are rarely forced to seek shelter, and their actions and habits then are not noticeably different from other times of the year.

In winter in the marshes on Bolivar Peninsula Mr. Pope says

that the birds were fully as common in winter as in summer, if not more so. In travelling through the grass the birds had well-beaten paths about six inches wide, and from the way these paths were beaten out in the vicinity of the bayous, it would appear that the birds were much more common.

Marshes inhabited by Rails are always intersected by numerous well-worn pathways leading through the tall grass, the grass being pushed to either side and the "marsh hair" being trampled and beaten down into the mud. These pathways are usually about five inches wide at the bottom.

XII. DISCUSSION.

The Louisiana Clapper Rail is fairly common and resident from Louisiana to Corpus Christi Bay. It is apparent that the Caribbean Clapper Rail rarely, if ever, appears in Texas.

The only records of the latter in the United States are the two specimens from Texas in 1889 (Sennett) and two specimens mentioned in Mr. Singley's 1893 paper. Undoubtedly Mr. Singley merely followed the lead of Mr. Sennett, as stated before. So the reader can see that 211.2 *Rallus longirostris caribæus* is included in the A. O. U. Check-List of North American Birds on the record of Mr. Sennett's two specimens from Texas, the identification of which he himself later questioned and virtually changed. Would it not seem best to drop this bird from the Check-List and extend the range of *Rallus crepitans saturatus* to include Texas?

A NEW SUBSPECIES OF DENDRAGAPUS, (*DENDRAGAPUS OBSCURUS FLEMINGI*) FROM SOUTHERN YUKON TERRITORY.[1]

BY P. A. TAVERNER.

IN the examination of a collection of *Dendragapus obscurus* recently acquired by the Canadian Geological Survey from the Teslin Lake region, on the Yukon-British Columbia boundary, it became evident that a new form of the species was probably represented. Two subspecies have heretofore been recognized as ranging into Canadian territory, *D. o. fuliginosus* and *richardsoni*. *Fuliginosus* is a dark bird with a light tail band and *richardsoni* a lighter one without a terminal band on the tail. The birds under consideration are without the tail band but are even darker than *fuliginosus*.

We had a fair series of both recognized forms from southern British Columbia, but all in spring and early summer plumage and hence hardly comparable with the new form which is represented entirely by late summer and autumn birds. The possibility existed that the darkness of the new birds but represented the new and unfaded plumage of the post-nuptial moult; therefore application was made to the U. S. Biological Survey and its chief Dr. Henshaw was courteous enough to place at our disposal what summer and fall specimens there were in the collection of that institution. A comparison of the specimens, including these, confirms our first surmise as to the racial differentiation of the forms and I therefore present the following new subspecies for consideration.

Dendragapus obscurus flemingi new subspecies.

FLEMING'S GROUSE.

Named after Mr. J. H. Fleming, C. M. Z. S. in recognition of the value of his ornithological work in Canada.

Subspecific Characters. Like *Dendragapus obscurus richardsoni*, without terminal tail band, but darker in general coloration even than *D. o. fuliginosus*.

[1] Published by permission of the Deputy Minister, Department of Mines.

D. o. richardsoni.[1]	*D. o. flemingi.*
Back, interscapulars and body color of rump. Olive-brown to fuscous.	*Back, interscapulars and body color of rump.* Dusky neutral gray.
Tail. Fuscous black. Tail feathers cut off sharply and squarely at end.	*Tail.* Dusky neutral gray. Tail feathers not having the same chopped off appearance. Middle and several lateral feathers slightly to markedly double-rounded at end.
Throat patch. Body color soiled creamy white.[2]	*Throat patch.* Body color pure white.
Sides of head and spotting of throat patch. Fuscous.	*Sides of head and spotting of throat patch.* Between neutral gray and deep neutral gray.
Around neck below throat patch. Between buffy brown and olive brown to clove brown, with sometimes a faint bluish tinge, deepening in front at lower neck to fuscous.	*Around neck below throat patch.* Between neutral gray and deep neutral gray, deepening in front at lower neck to dusky neutral gray.
Breast and underparts. Light mouse gray.	*Breast and underparts.* Between neutral gray and deep neutral gray.

Description of Type specimen. Type, adult male, No. 6651 Museum of the Geological Survey, Department of Mines, Canada. Near Teslin Lake, Yukon Territory, October 10, 1912. Clement Lewis, Collector.

Back, rump and tail, dusky neutral gray. Central feathers of tail and some lateral ones double rounded at ends.

Upper tail coverts, fuscous black, finely but sparsely vermiculated with buffish slate.[2]

Scapulars, wings and upper wing coverts fuscous, lightening towards wing tip. All, except flight feathers, finely marked with shades between rusty[2] and grayish.[2] Some scapulars with white shaft streaks, widening at terminal to poorly defined marginal spots. The latter persisting on some of the lesser coverts as vague spots and narrow borders.

Below, between neutral gray and deep neutral gray, and obscured posteriorly by a white tipping of the feather ends that blends into the white of the basal under tail coverts.

Lower breast feathers with white shaft lines broadening towards the flanks and posteriorly where they develop into broad terminal spots, streaks and bars. A fine vermiculation of buffy[2] and grayish[2] overlaying the body color of the feather tips of the sides.

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[1] All color terms except where otherwise stated, from Ridgway's "Color Standards and Nomenclature," 1912 ed.

[2] These terms are not from "Ridgway's Color Standards."

Under tail coverts dusky neutral gray or black with prominent white shaft lines and final borders. White increasing towards base of tail until body color of feathers is hidden.

Head from deep neutral gray to neutral gray darkest on crown and ear coverts, overwashed with rusty [1] strongest on forehead at base of bill and more or less obscuring body colors of darker feathers and at last dying away at back and sides of upper neck as a faint olivaceous [1] tinge.

Throat patch, white with irregular deep neutral gray spotting, aggregated on malar region and each spotted feather terminated with small white border.

Lores, deep neutral gray, with white flecking.

Dark feathers of the breast band creamy white basally, the white gradually encroaching on the dark tips towards the sides, finally usurping most of the feather and making a semi-concealed white streak down the sides of the neck to the bend of the folded wing.

The characters of the female are less marked than of the male and without series for comparison may be difficult of recognition. However, they average in the same directions as the male being bluer underneath than *richardsoni* and darker dorsally, with the rufous [1] or rusty [1] markings bolder and more decided in character.

Measurements (in inches). Male, average of four specimens.

Wing, 8.25–8.75, (average 8.51); tail, 6.5–6.75 (average 6.33); tarsus, 1.70–1.80 (average 1.75); exposed culmen, .65–.75 (average .71).

Female average of twelve specimens.

Wing, 7.45–8.10 (average 7.70); tail, 5.10–5.75 (average 5.25); tarsal 1.48–1.68 (average 1.55); exposed culmen, .65–.71 (average .69).

Distribution. This description is based entirely on specimens taken within thirty miles of Teslin Lake, on the boundary between British Columbia and Yukon Territory, Longitude 130°–30′, at the west base of the Cassiar Mountains. The range of the form cannot therefore be defined, but a study of the material examined is suggestive.

The male specimens in the series are as follows: — British Columbia: Trail, Midway and Revelstoke: 7 specimens.

Montana and Idaho: Preuss Mts., Fiddle Creek; and Nyak and Beartooth Mts.: 4 specimens.

Mackenzie; Mackenzie River: 1 specimen.

Yukon Territory, Teslin Lake: 4 specimens.

	Wing	Tail	Tarsus	Culmen	General Color
Montana and Idaho	9.06	6.56	1.80	.80	Light
British Columbia	8.90	6.96	1.77	.75	Slightly darker
Mackenzie	8.75	6.55	1.70	.80	Light
Teslin Lake, Y. T.	8.51	6.33	1.75	.71	Dark.

[1] These terms are not from Ridgway's "Color Standards."

It will be seen that the most southern birds are the largest and lightest; the northern smallest and darkest while those from lower British Columbia are intermediate, though closer to the southern than the northern race. The Mackenzie form, being represented by but a single specimen in not very high plumage, cannot be definitely placed in the series though it agrees closely with the Montana and Idaho specimens. No specimens from the type locality of *richardsoni* (the northeast corner of Rocky Mountain Park, Lat. 53°, Long. 115°) being obtainable I assume from the above that it ranges up the east side of the Rocky Mountains and through them south of the International Border in unmodified form while the intermountain birds, *flemingi*, as they distribute northward from the boundary, become smaller and darker. It is possible that on examination, birds from further north of Teslin Lake will exhibit these characters in a still more marked degree.

AN UNDESCRIBED GALAPAGOS RACE OF OCEANODROMA CASTRO.

BY JOHN TREADWELL NICHOLS.

IN his Monograph of the Petrels (London 1907–10), Godman says in regard to *Oceanodroma castro* (Harcourt): "This species is a form of *O. leucorrhoa*, with which it has often been confounded," etc. To the writer this seems an undervaluation of the species *castro*. He also thinks that too little emphasis has here been placed on the hair-like black shafts in the white upper tail coverts of Leach's Petrel,— otherwise an excellent comparison of *castro* and *leucorrhoa* is given.

The unfortunately small amount of material at hand for comparison indicates the existence of three recognizable races of *castro*. Pacific birds have a slightly more forked tail, and the Galapagos

one a heavier bill with stronger hook. The following table shows the tail differences; the bill differences are perhaps better shown by the figures.

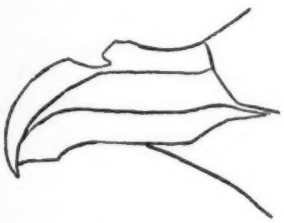
Whereas Atlantic and Pacific birds have little chance to interbreed, the differences are so slight that intermediates would be expected and the relationship is best expressed by considering them subspecifically distinct.

Oceanodroma castro bangsi ssp. nov.

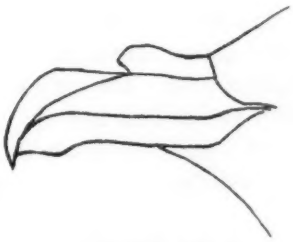
Type. No. 12413. Collection of E. A. and O. Bangs. ♀. Collected 1° N. 93° W., February 6, 1901, by R. H. Beck.

Bill heavier and more strongly hooked than usual in the genus. Sooty black, wing coverts slightly browner. Bases of tail feathers, except middle pair, broadly white, the shafts of the feathers pale. Upper tail coverts are almost all lacking in the type specimen, two or three remaining ones white to the end. Probably the coverts were much as usual in the species, and the remaining feathers very likely have had black tips worn off. Bill and feet black. Length (skin) 7.1 in.; wing 6.2; tail 3.6; bill 0.6; tarsus .95; middle toe and claw 1.0.

The only other specimen at hand, from Cocos Island, has wings moulting and not comparable. The tail and its coverts are also in



O. c. bangsi.



O. c. cryptoleucura.

poor condition. Some of the latter have sharp black tips as usual in the species. Its bill is not dissimilar to that of the Galapagos bird.

Named for Mr. Outram Bangs, of the Museum of Comparative Zoology, Cambridge, to whose appreciation of slight differences our knowledge of racial variation is indebted.

Oceanodroma castro castro (Harcourt).

				Outer tail feathers extend beyond inner in closed tail	Bill	Hook of Bill (straight distance)
No. 11000 E. A. & O. Bangs	♂ Porto Santo.	Nov. 27, 1902		.25 in.	.55 in.	.28 in.
No. 15322 Jonathan Dwight, Jr.	♂ " "	Dec. 6, 1903		.20	.59	.30

Oceanodroma castro cryptoleucura (Ridgway).

No. 10984 Mus. Comp. Zoölogy	Sandwich Islands.		.40	.60	.27
No. 10985 Mus. Comp. Zoölogy	" "		.38	.57	.30

Oceanodroma castro bangsi ssp. nov.

No. 12413 E. A. & O. Bangs (Type)	♀ 1° N. 93° W.	Feb. 6, 1901	.34	.62	.35
No. 70299 Amer. Mus. Nat. Hist.	Cocos Island.	June 18, 1898	—	.63	.33

THIRTY-SECOND STATED MEETING OF THE AMERICAN ORNITHOLOGISTS' UNION.

THE Thirty-second Stated Meeting of the American Ornithologists' Union convened in Washington, D. C., Monday evening, April 6, 1914. The business meeting was held at 'The New Ebbitt,' 14th and F Sts., and the public sessions, commencing Tuesday, April 7, and lasting two days, were held in the Auditorium of the new building of the U. S. National Museum.

BUSINESS SESSION: The meeting was called to order by the President, Dr. Frank M. Chapman. Twenty-six Fellows were present. The Secretary's report gave the membership of the Union at the opening of the present Stated Meeting as 1101, constituted as follows: Fellows, 50; Retired Fellows, 4; Honorary Fellows, 14; Corresponding Fellows, 57; Members, 74; Associates, 902.

Since the last meeting (November, 1913) the Union lost twenty-

seven members, three by death, and twenty-four by resignation. The deceased were:

Dr. Ora Willis Knight, a Member, who died in Portland, Maine, November 11, 1913, aged 39 years; also the following Associates: Charles S. Welles, of Elwyn, Pa., who died Feb. 24, 1914, and Henry W. Beers, who died in Bridgeport, Conn., April 2, 1914, aged 47 years.

The report of the Treasurer showed the finances of the Union to be in a satisfactory condition, the accounts being audited by a Certified Public Accountant.

Albert K. Fisher was elected President; Henry W. Henshaw and Witmer Stone, Vice-Presidents; John H. Sage, Secretary; Jonathan Dwight Jr., Treasurer; Ruthven Deane, William Dutcher, Frederic A. Lucas, Wilfred H. Osgood, Chas. W. Richmond, Thos. S. Roberts, and Joseph Grinnell, members of the Council.

Egbert Bagg, Utica, N. Y.; Dr. Thomas Barbour, Cambridge, Mass.; Robert Thomas Moore, Haddonfield, N. J.; Robert C. Murphy, Brooklyn, N. Y., and John Treadwell Nichols, of New York City, were elected to the class of Members, and the following twenty-six persons were elected Associates:

Miss Gertrude Mary Allen, New York, N. Y.
G. A. Bolden, Charleston, W. Va.
J. J. Boyle, Washington, D. C.
Mrs. Edward Gay Butler, Berryville, Va.
Miss Stella Risley Clemence, New York, N. Y.
Miss E. S. Day, Brooklyn, N. Y.
D. Douglas Findlay, Ontario, Canada.
Joseph A. Hagar, Newtonville, Mass.
Miss Helen E. Haynes, Lebanon, N. H.
Frank Hennesy, Ottawa, Ont.
Miss Mabel Hotchkiss, Waterbury, Conn.
Wilbur Wallace Johnson, East Orange, N. J.
Frank H. Main, New York, N. Y.
O. J. Murie, Portland, Oregon.
Free Ottemiller, York, Pa.
Neill Pennell Overman, East Orange, N. J.
Charles Phillips, Minneapolis, Minn.
Miss Anna H. Pierpont, Waterbury, Conn.
E. F. Pope, Colmesneil, Texas.
Charles A. Robbins, Onset, Mass.
Mrs. Stilwell, Philadelphia, Pa.

C. W. Tate, East Orange, N. J.
Titus Ulke, Washington, D. C.
A. W. Upham, Boston, Mass.
Mrs. Kate P. Vietor, Brooklyn, N. Y.
Lem Williams, Shonkin, Montana.

Drs. Allen, Chapman, Dwight, Jos. Grinnell, Merriam, Palmer, Richmond and Stone, and Messrs. Brewster, Nelson, Oberholser and Ridgway were appointed 'Committee on Classification and Nomenclature of North American Birds.'

The following amendment to the By-Laws proposed at the last Stated Meeting of the Union was adopted:

Article I, Section 7, now reads:

"Associates shall be residents of America, and shall not be limited in number."

The object of the change was to permit residents of South and Central America to become Associates.

PUBLIC SESSIONS. *First Day.* The meeting was called to order by the President, Dr. Fisher.

The papers read during the morning session were as follows:

'Some Letters from Robert Kennicott,' by Ernest Thompson Seton. Remarks followed by Dr. D. G. Elliot who personally knew Mr. Kennicott.

'On the Zonary Stomach in the Euphonias,' by Alexander Wetmore. Remarks followed by Messrs. Fuertes and McAtee.

'Visits of Pine and Evening Grosbeaks,' by Mrs. E. O. Marshall. Remarks followed by John T. Nichols.

'A Note on the Herring Gull,' by John Treadwell Nichols. Remarks followed by Mr. Rogers, and the author.

'Side Light on the Saw-whet Owl,' by Ernest Thompson Seton.

The following papers, all illustrated by lantern slides, were presented at the afternoon session.

'Notes on Lower California Birds,' by Dr. Paul Bartsch.

'Notes on the Distribution of Breeding Egrets in the United States,' by T. Gilbert Pearson. Remarks followed by Dr. Bartsch.

'Winter Feeding of Birds,' by B. S. Bowdish.

In the evening the members of the Union and their friends met at dinner at the Wallis Café.

Second Day. The meeting was called to order by President Fisher. The papers of the morning session were:

'The Curious tail molt of Rhinoplax, with exhibition of specimens,' by Alexander Wetmore.

'Results of the Federal Bird Migration Regulations,' by Dr. T. S. Palmer. Remarks followed by Drs. Merriam, Bishop, and Chapman, Mr. Bond, and the author.

'Are Insectivorous Birds Decreasing?' Subject introduced by Dr. Frank M. Chapman. Remarks followed by Drs. Merriam, Chapman and Stone, Prof. W. W. Cooke, Mr. Waldron DeWitt Miller, and the Chair.

At the afternoon session the following papers, all illustrated by lantern slides, were presented:

'A Trip to Pelican Island, Florida,' by Ernest Thompson Seton. Remarks followed by Drs. Chapman, Bartsch, and T. S. Palmer.

'Notes on Feeding Birds,' by Frank Bond.

'Winter Birds at Ithaca, N. Y.,' by Louis Agassiz Fuertes.

'Migration in the Mackenzie Valley,' by Prof. Wells W. Cooke.

'With the Terns on Bird Key, Tortugas,' by Dr. Paul Bartsch.

The following papers were read by title:

'Anatomical Notes on Trochalopteron and Sicalis,' by Prof. Hubert Lyman Clark.

'The Intimidation Display of the White-breasted Nuthatch,' by Dr. Arthur A. Allen.

'Ten Minutes with the Birds of the District of Columbia,' by Dr. Paul Bartsch.

'Random Notes on Bird Preservation,' by Edward Howe Forbush.

Resolutions were adopted thanking the Board of Regents of the Smithsonian Institution for the use of the auditorium in the new building of the United States National Museum for a place of meeting, and for other courtesies extended; to the Local Committee and other Washington members of the Union for the cordial welcome and generous hospitality shown visiting members; and to Dr. Frank Baker, Director of the National Zoölogical Park, for his polite invitation to the members of the Union to visit the Zoölogical Park.

The Stated Meeting just closed was the first one ever held in

the Spring — the change in time being the result of a desire expressed by numerous members of the Union.

After adjournment short field excursions were made in the vicinity of Washington, April 9 and 10, by members of the Union, under guidance of Prof. Cooke and Mr. E. A. Preble of the Biological Survey.

The next meeting of the Union will be held in San Francisco in May, 1915.

JOHN H. SAGE,
Secretary.

GENERAL NOTES.

A Misinterpretation.— While photography is in many instances the only accurate and irrefutable means of determining the movements of rapidly moving objects there appears to be a misinterpretation in connection with the explanation of a figure in the April 'Auk.' I refer to the article, "Does a grebe spread its wings just before diving?" by Mr. Verdi Burtch, illustrated with Plates XXI and XXII. Figure 3, Plate XXI is a picture of a diving grebe taken instantaneously at the moment of disappearance and, as the author tells us, "shows a dark area representing the depression in the water where the grebe sat at the beginning of the exposure, *the 'ghost' of its wings fully spread out behind* as it started to lunge forward and the grebe itself nearly submerged a full length ahead."

I conclude that the so-called 'ghost' is considered to be the vague photographic impression made at the very beginning of the exposure. The shutter then remained open until the grebe had reached the almost submerged position at the right. If the exposure had been of that duration a continuous blurred image traversing the path taken by the grebe would have been the inevitable result and not, as we have had it explained, "a 'ghost' of the wings" followed by a photographically undisturbed area and then at the very close of the exposure a fairly well defined image of a grebe diving with its head held erect. In any event the supposed "ghost of the wings" would appear dark instead of light as seen in the figure on Plate XXI and intensified in the enlargement. Why should the grebe make such an intense and sharply defined image on the photographic plate just as it is disappearing while during the first part of the exposure practically no impression was made? It might be argued that the impact with the water had arrested its progress, but it does not seem possible that this retardation can come so suddenly and be as great as the relative intensities

of the first and last portions of this exposure would show. Although I admit an unfamiliarity with Holbœll's Grebe, if its methods of diving are at all similar to those of other grebes and water fowl as a whole, the erect head (if it is such) at the right side of this photograph appears odd. Except when the birds employ a gradual sinking motion the head is thrust forward and under when plunging and would not be in sight at the time the rump was just disappearing.

While I realize that half-tone reproductions do not show all the details present in the photograph or better still, the negative, it seems that there has been a misinterpretation of the evidence presented in this picture. A much more logical interpretation would be that the so-called "ghost of the wings" is nothing more than spray caused by the bird's rapid plunge and backward thrust of the feet which, being highly reflective, would quite naturally appear light; the dark spots are shadows caused by the disturbance in the water; and the grebe may be anywhere from a few inches to several feet below the surface.— E. R. KALMBACH, *Biol. Survey, Washington, D. C.*

Concealing Postures of Grebes.— On October 3, 1913, I was fishing for bass in the tidal streams at Gibbstown, N. J. At one spot there was a very shallow ditch some five or six feet in width, containing at the time possibly six or eight inches of water.

A Pied-billed Grebe (*Podilymbus podiceps*) had been observed in the ditch about 11 A. M. and had made no special effort to get away with the exception of one or two half-hearted dives, the water of course not being deep enough. Early in the afternoon I walked down to the ditch with the hope of getting a closer view of the bird. I could see nothing of it as I gazed down upon the great mass of water lilies and other aquatic plant life which abounded in the ditch, but after a moment I became aware of an oblong body on the opposite edge of the ditch which up to that time had been taken for a partly submerged and mud-covered leaf but which was seen to be nervously moving at intervals and producing small circular wavelets on the water which in all other parts of the ditch was perfectly calm.

I partly turned with the intention of taking another step to get a better view, and was surprised to see a slender snake-like head a few inches in front of the object I had been watching, turn slowly about on the surface of the water and follow my movements. The facts were now self-evident, and the object I had been watching was nothing more than the glossy back of the grebe, which realizing the hopelessness of trying to escape by diving had resorted to this method of concealment, flattening itself out, on the surface of the water with its neck stretched out at full length. The wavelets were caused by a nervous movement of the feet beneath the water, doubtless getting ready for the dash which was about to follow.

I bent over in an effort to get a closer view, and the bird now evidently frantic with fear made an effort to sink itself breast first in the shallow stream. The breast and neck were forced beneath the surface, while the

posterior portion of the body including the feet and legs were at a sharp angle and completely free from the water. All this time the feet were paddling the air with terrific rapidity, and the bird seemed to have not the slightest conception that its body was not completely submerged although no effort was made to increase its supposed locomotion by using the wings.

Thinking that I might catch the bird I made one more step forward at the same time reaching for it with my hands, when it bounded from the water and with much flapping of wings and paddling of feet succeeded in covering the few yards down the ditch to the deep water of the sluice where it immediately dove and disappeared. At no time while making its progress down the ditch did the bird rise high enough for its wing tips and paddling feet to clear the water.

April 18, 1914, I found a pair of grebes in an absolutely unprotected stretch of water on Darby Creek, Delaware Co., Pa. The creek at this point is some fifteen or twenty feet in width and a low grassy meadow bordering it on both sides, and terminating at the water's edge in an abrupt bank some three to four feet in height. A few scattered clumps of alders grew in the water at the foot of the bank and at this season of the year with no leafy vegetation in evidence any living object, no matter how small, is plainly visible. The birds in question dove immediately upon being observed and one was never seen again. The other came to the surface after a few seconds, a considerable distance up the creek, but immediately dove again and disappeared. The bird was sighted regularly every morning following and just as regularly disappeared. On the morning of the twenty-third with the aid of the glass it was observed sitting quietly on the surface of the water about a quarter of a mile up the creek.

An hour later while again passing this spot I decided to take another look at the bird and a sharp lookout was kept for it, but absolutely no trace of it was found. The surface of the water lay like a mirror. Walking slowly along the bank I scanned the edges of the stream on both sides, but could see nothing resembling a living object, and I was about to leave the spot when my attention was attracted by an oblong object at the foot of a clump of alders directly opposite, and my first thought was that the object was the carapace of a turtle, but as it was rather early in the season for turtles I trained my glasses upon the object and was amazed to discover that it was the grebe. There at the foot of the alders, stretched full length and flattened out upon the surface of the water in exactly the manner of the Gibbstown bird, its bill pointed directly towards me, and although no movement of the head was in evidence it was plain to be seen that the bird was watching my every movement.

I now called the attention of a friend who was with me to the fact that the object before us was the bird for which we had been searching, and although he could see the oblong object plainly enough, he could not outline the bird. I took another step towards the edge of the bank and as I did so there departed from the sides of the bird those same small circular

wavelets and I realized that the bird was moving its feet preparatory to the dive. The next instant as my friend approached, the bird slipped quietly from the alders and disappeared head first beneath the surface. The actions of the two birds were so absolutely alike that I think they must constitute a regular practice on the part of these Grebes.— DELOS E. CULVER, *Addingham, Pa.*

Herring Gulls at Sea.— On page 182 of 'The Auk,' Dr. Strong says, "Herring Gulls do not wander far from land relatively, and they are probably usually within a reasonable distance from fresh water."

On February 8–16, I was on a voyage from New York to Madeira. As we left the American coast, a flock of about forty Herring Gulls accompanied us.

They decreased in number, gradually, and, as their numbers decreased, they fell further behind. Herring Gulls were identified for fully half the distance to Madeira, but on the sixteenth when the birds came close to the ship they were found to be yellow-legged gulls which had doubtless come out from the islands.— ROBERT BARBOUR.

Glaucous Gull (*Larus hyperboreus*) **on Fresh Pond, Cambridge, Mass.**— Mr. Brewster in his "Birds of the Cambridge Region" records an occurrence of a Glaucous Gull on Fresh Pond in the '*hutchinsii*' plumage on November 29, 1899. I am able to furnish a second record. On March 2, 1914, in the middle of the forenoon one appeared among the Herring Gulls which were coming in from Boston Harbor to rest and bathe. It was an entirely white bird and much larger than the Herring Gulls. Ice covered most of the surface of the pond, but about an open area reaching to the shore, where the water is received by an entrance pipe, was a collection of Black Ducks and Herring Gulls with a pair of Golden-eyes, a Mallard Drake, and three Great Black-backed Gulls. Other Herring Gulls were arriving, and with a squad of these came the Glaucous Gull. It remained to bathe, successively took two or three flights about, but returned after each flight to the open water or to the edge of the ice, where were gathered the Black Ducks. Its position among these at times made the bird very striking in its complete whiteness. It was still present when an hour later I came away. The next day again this Glaucous Gull was present, arriving with Great Black-backed Gulls and Herring Gulls at 11.20 A. M., but the following day it was absent, and it was not seen again.— HORACE W. WRIGHT, *Boston, Mass.*

European Widgeon (*Mareca penelope*) **at Boston, Mass.**— On October 24, 1913, two young male European Widgeon appeared on Jamaica Pond. When first seen, they were very shy and swam restlessly about in close companionship, occasionally giving the characteristic call of the species, consisting of two notes, "*Whée-yoŭ.*" They were still present the following day, and were afterwards viewed from time to time during

the remainder of October and throughout November and December. When in early January ice was forming on the pond, one of the two left on the third or fourth day; the other remained to January 17, when ice had covered all but a few small areas of the pond. These young males showed little or nothing of the creamy buff crown upon their arrival, but they gradually developed this feature. So at first their true identification was difficult, but the two-note call and chestnut color of the head clearly differentiated them from Baldpates. By December the plumage of the adult male European Widgeon was quite fully developed, and at the time they left they lacked little of its completeness. One gained the adult plumage somewhat earlier than the other, so they could readily be distinguished. A female Baldpate joined them about December 1 and left on January 16, one day earlier than the later remaining Widgeon. A cold wave had brought the temperature at the pond down to 13° below zero on the thirteenth.

In early December their companions on the pond were 400 to 500 Black Ducks, the number varying from day to day, several Mallards, a few Scaup Ducks, 90 to 100 Lesser Scaup, a young male Buffiehead, 3 Ruddy Ducks, 25 to 60 Mergansers, 8 Coot, and a few Herring Gulls, a collection of water fowl, the numbers of which had been steadily increasing during November and were decreasing in late December.

This occurrence of European Widgeon on Jamaica Pond was the first in Boston and its immediate vicinity, if I am not in error. Like other wild ducks which visit protected waters, these Widgeons soon become unsuspicious and allowed near approach. They were objects of interest and pleasure to many observers throughout their long visit.— HORACE W. WRIGHT, *Boston, Mass.*

An Egret on Long Island.— In connection with Mr. R. Heber Howe, Jr.'s note on the American Egret, in the April 'Auk,' and the one by Mr. G. Kingsley Noble to which he refers, I would like to report a single bird of this species which I observed at Mastic, Long Island, where it is very rare, on August 9, 1913. It was identified with certainty.— JOHN TREADWELL NICHOLS, *New York, N. Y.*

The Woodcock Carrying its Young.— It has been the good fortune of the writer to see recently two successive flights of our native Woodcock carrying its young nearly as large as itself, sitting upright, grasped and suspended by the claws of the mother bird. I am told that the sight is an unusual one, and that a brief account of it may interest your readers.

I was on a little botanizing trip near a river bottom, looking especially for Golden seal plants and flowers which were somewhat plenty in that vicinity; the season being late for the flowers, late May or early June. I have no record of the exact date.

Startled by a loud whirring of wings near by, very like, yet perceptibly different from that of the Partridge, I saw the slow flight of the bird with its

burden over the brushwood, but did not then in the brief and surprised view, distinctly make out the object carried. A few minutes later a second flight occurred close by, which I plainly observed and noted in its full particulars. After a time I indistinctly remembered having seen years before, an engraving of a like scene, which I later found in Chapman's Farm Encyclopedia. The print is very lifelike, except that the young which I saw was relatively larger than here shown.— C. C. McDermid, *Battle Creek, Mich.*

A Feeding Habit of the Ruddy Turnstone (*Arenaria interpres morinella*).— September 7, 1913, at Lincoln Park, Chicago, Ill., I saw about a dozen of these birds busily engaged in feeding about a large flat-topped pile of fertilizer to be used on newly-made land. Most of them were digging in the pile near the edges, a few were perched on the top, while one or two others were turning over sticks in the usual fashion on the barren ground a few feet away. Those on top were alert and not feeding; the others seemed much more oblivious to possible dangers. The feeding birds reminded one very much of chickens, minus the scratching. When they were scared away a few alighted on the beach, but the rest, after circling, came back to the pile. They were unusually numerous compared to the numbers seen in previous years. They were associated with numerous small sandpipers, and two or three small plovers. The pile stood some distance from the beach, so that the birds could not have reached it in running about their usual habitat, and it seems reasonable that this new habit was formed through imitation of the other shore birds, which are not so much restricted to beaches.— Edwin D. Hull, *Chicago, Ill.*

Willow Ptarmigan in Montana.— I recently mounted three Willow Ptarmigan (*Lagopus lagopus lagopus*) received February 21, 1914, from Mr. L. W. Hill of St. Paul, Minn., who secured them near Midvale, Montana, in the New Glacier Park. As I have never before seen any ptarmigan except the White-tailed species from this region, the occurrence seems worthy of record.— Harry P. Stanford, *Kalispell, Mont.*

Choucalcyon *versus* **Sauromarptis.**— In my "Revision of the Classification of the Kingfishers" (Bull. Amer. Mus. Nat. Hist., XXXI, 1912, p. 241), I stated that the name *Choucalcyon* Lesson, Traité D'Orn., 1831, 248, "type by subsequent designation (Gray, 1855), *Alcedo gaudichaud* Quoy and Gaim." would have to replace *Sauromarptis* Cab. & Heine, proposed on grounds of purism.

Dr. Gregory Mathews has kindly called my attention to the fact that Lesson himself in 1837 designated as the type of *Choucalcyon* the bird now known as *Dacelo gigas* (Bodd.). In the Complément des œuvres de Buffon, Oiseaux, 1837, p. 355 (a work which was not available when my paper was prepared) Lesson writes: "Le type de ee groupe est le grand alcyon de la Nouvelle-Hollande, que Buffon croyoit provenir de la Nouvelle-Guinée, et qu'il a figuré enl. 663." As Buffon's plate represents *Dacelo gigas*,

Choucalcyon therefore falls as an absolute synonym of *Dacelo* (type by monotypy *D. gigas*).— W. DEW. MILLER, *Amer. Museum of Natural History, New York City.*

The Bobolink breeding in Southeastern Pennsylvania.— The western side of the Delaware in southeastern Pennsylvania is flanked by the "Uplands" which rise from the Coastal Plain along the 100 foot contour. These Uplands reach westward to the Blue Ridge, one hundred miles away — a well-watered, rolling country of low hills and mature valley streams. The land is one of farms — wheat, corn, meadow pasture and grassland. At my home at Cheyney, on the border of Delaware and Chester Counties, a typical rural district, I have often seen and heard the Bobolink for a few days during its northward passage in May. This year (1914) several pairs have remained and are nesting in a wide field of clover just back of my house. I hear the tumultuous song of the birds throughout these early summer days and see the male perched on tree tops, wheeling and hovering over the field and dropping into the grass, all the while voluble and ecstatic as the Bobolink always is at this season. There appear to be several pairs, but I have made an indifferent search for nests and have not as yet found one. The birds, however, have been with us for the past three weeks and every day this gladsome voice is a continual delight.

I have never understood just why the Bobolink did not remain with us when clover and meadow grass were so alluring. They are here this year and I, for one, am glad of this added touch of more northern summers.— SPENCER TROTTER, *"Pennyscroft," Cheyney, Penna.*

Evening Grosbeaks in Pennsylvania.— In February last a flock of about 400 Evening Grosbeaks (*Hesperiphona vespertina vespertina*) remained for some days about Lewisburg, Union Co., Pa. Smaller flocks were also observed during periods of deep snow in Lycoming and Bedford Counties and some specimens secured.— B. H. WARREN, *Everhart Museum, Scranton, Pa.*

Nuttall's Sparrow (*Zonotrichia leucophrys nuttalli*) **wintering in King Co., Wash.**— For the last two years, a pair of Nuttall's Sparrows have spent the winter about our garden. Noticing them for the first time, during the late Autumn of 1912, and thinking it an unusual occurrence, I made an entry of it in my note-book. At the end of a week, I was greatly surprised to find them still frequenting the shrubbery, as I had thought them to be merely stopping for a rest, on their journey southward. As the weather was steadily becoming colder, so much so that a light snow fell, I was able to encourage them by feeding. In consequence they became fairly tame, and seemed quite content to remain.

Early, the following spring, I noticed that they were building in an ivy-covered house on the lawn. Two broods of young were raised, the parents becoming exceedingly tame at this time. The entire family remained

together, until early autumn, all but two of the flock then disappearing. I have every reason to believe them to be the same pair which remained during the previous winter, as they displayed the same traits and acted in precisely the same manner. Together with several Song Sparrows, they spent most of the day in a willow copse, over a damp place, at the near corner of the orchard, always repairing, however, to the ivy-covered house to roost.— THEO. E. W. REYNOLDS, *Kent, Wash.*

The Bahama Swallow in Cuba.— While Governor General of the Philippine Islands W. Cameron Forbes took much interest in the bird fauna of the group and he made for the Museum of his Alma Mater — The Museum of Comparative Zoölogy, at Harvard University — large and very valuable collections of Philippine birds, and found, he says more real rest and relaxation, during his short vacations, in bird collecting than in any other pursuit.

Since his retirement from the Governorship of the Philippines, Mr. Forbes has kept up his active interest in bird collecting and last winter during a hurried trip, which included a stop of a day or two each, in Cuba and Jamaica and a few days in Guatemala secured for us no less than one hundred and twenty skins.

In Cuba Mr. Forbes collected only at Nipe Bay in the northeastern end of the island. There he secured on March 7 and 8, 1914, skins of twenty species of birds, most important of which are two specimens of the Bahama Swallow, *Callichelidon cyaneoviridis* (Bryant) which I believe has not been recorded before from Cuba. The skins both taken March 8, 1914, are Nos. 65504 and 65505 M. C. Z. and are ♂ and ♀. Mr. Forbes says that this swallow was exceedingly abundant and generally distributed at Nipe Bay, feeding in the manner of its kind or resting on the telegraph wires.

Bryant, Cory and others who have written on the birds of the Bahamas, mention the swallow as present in those islands in the winter months, but as less abundant there than in spring and summer. It must breed rather late as Bryant states that in specimens killed so late as April 28 the genital organs showed no signs of the near approach of the breeding season.

Whether the Bahama swallow is resident in northeastern Cuba or only occurs there as an abundant winter visitor we cannot say. Mr. Forbes' discovery deprives the species of the distinction of being the only genus of birds peculiar to the Bahamas.— OUTRAM BANGS, *Museum of Comparative Zoölogy, Cambridge, Mass.*

The Coahuila Cliff Swallow (*Petrochelidon fulva pallida*) **in Texas.**— My collector, who has been in Kerr County, Texas, since the first of last March, sent me among other bird-skins, a fine series of Cliff Swallows, which at first I thought were *Petrochelidon lunifrons tachina* Oberholser. On examining them carefully however, I saw they were different, for they were too large and much paler than this subspecies. I sent them to Mr. Outram Bangs, who identified them as *Petrochelidon fulva pallida* Nelson;

a Mexican species that I cannot find has ever before been recorded from the United States. It was previously known from Coahuila and Tamaulipas.

I have just received word from my man in Kerr County that these birds are beginning to nest.— JOHN E. THAYER, *Lancaster, Mass.*

The Tufted Tit — A New Record for Canada.— On May 2, 1914, at the far end of the trees on Point Pelee, Ontario, Mr. J. S. Wallace found two Tufted Tits (*Bæolophus bicolor*) one of which at least was very talkative. He called the writer over and after watching them a short time we secured one.

This bird has been sought at Point Pelee as being the most likely place, ever since the present contingent began to visit the Point regularly, nearly ten years ago. The bird occurs every fall on Belle Isle which lies between Detroit, Michigan, and Windsor, Ontario, and has been vainly sought on the mainland in Windsor as well as lower down on the Detroit River.

In lower Ontario the Black-capped Chickadee is the only regular visitor of the family and therefore it was quite an extraordinary event that on May 2 and 3 we saw not only the Black-cap and the Tufted but the Hudsonian as well. The latter was a single bird talking away to himself at a great rate and very unsuspicious.— W. E. SAUNDERS, *London, Ontario.*

Blue-Gray Gnatcatcher (*Polioptila cærulea*) **at West Haven, Conn.**— On the morning of April 30, 1914, I observed a Blue-gray Gnatcatcher at West Haven, Conn. The bird was very tame and allowed me to observe it for some time, part of the time from a distance of not more than fifteen feet. Six records of this species in Connecticut are recorded by Sage and Bishop in the "Birds of Connecticut" (page 176). This constitutes the seventh record, and the first since 1892.— ARETAS A. SAUNDERS, *West Haven, Conn.*

Three New Birds for Champaign County, Illinois.— Rare visitors are the rule this spring and my list of "An Illinois Ten-mile radius" has been lengthened by the appearance of the rare Bohemian Waxwing (*Bombycilla garrula*), the rarer, Yellow-headed Blackbird (*Xanthocephalous xanthocephalous*) and the extremely rare American Magpie (*Pica pica hudsonica*).

Twelve Bohemian Waxwings visited my residence yard on February 26, 1914, the day following a severe northern blizzard. Examined with glasses at sixty feet, each marking was distinctly observed. Cedar Waxwings are not uncommon with us and are noticeably smaller in comparison with their northern Gypsy cousins. After a half-hour's rest they wheeled into the air as one bird and disappeared in the west.

On April 26, 1914, the first American Magpie recorded in Illinois since 1892, was being harassed by a half-dozen Crows in a hedge on the S. S. Love estate, two miles east of Philo. His white markings and strange cries and chatterings made of him a conspicuous object. All other Illinois records are winter ones, and this visit was all the stranger because of its occurring east of central Illinois.

On April 29, two records were made of the Yellow-headed Blackbird. These are the first authentic records for the county, although I have a male in my collection captured in this neighborhood with data lost.

One of the April 29 records, was a lone male in the Meharry orchards three miles west of Philo. On the same day a second male was observed on the Gaurd farm three miles north. The last Yellow-head was following a plow in the field in company with a flock of Bronzed Grackles and was observed at a distance of twenty feet.

These three new birds for Champaign County gain numbers 197, 198, and 199 respectively, in my list of "Birds of an Illinois Ten-mile radius." The circle is pierced by the fortieth parallel of latitude and lies twenty-five miles west of the Indiana line.— ISAAC E. HESS, *Philo, Ill.*

New Bird Records for Arizona.— The appearance of Swarth's most excellent "List of the Birds of Arizona," seems to mark an opportune time for recording several Arizona bird notes that have not yet found their way into print, and for calling attention to a few printed records that are not included in Swarth's list.

Gavia pacifica. PACIFIC LOON.— One taken by Dr. Mearns September 20, 1886, at Fort Verde, and now in the collection of the American Museum of Natural History.

Erismatura jamaicensis. RUDDY DUCK.— One taken by Dr. Mearns January 24, 1887, at Peck's Lake, and now in the collection of the American Museum of Natural History.

Chen rossi. Ross's GOOSE.— One taken by Dr. Mearns October 24, 1887, at Fort Verde, and now in the collection of the American Museum of Natural History.

Ardea herodias treganzai. TREGANZA'S HERON — Information was given to E. W. Nelson in August, 1909, that two pairs had nested at a pond two miles east of Tuba.

Catharista urubu. BLACK VULTURE.— Several seen, May, 1890, by Dr. A. K. Fisher in the Tonto Basin.

Pandion haliaetus carolinensis. OSPREY. Several seen by Dr. A. K. Fisher, June 26–29, 1892, near Camp Verde; they must have been breeding not far distant.

Cryptoglaux acadica. SAW-WHET OWL.— Young in the nest were found by Dr. Mearns on San Francisco Mountain, June 12, 1887; the same collector took a specimen December 17, 1893, at La Osa, Sturgis Ranch, Pima County.

Glauciduim phalænoides. FERRUGINOUS PYGMY OWL.— Winter records are: near Camp Lowell, January 24, 1872 (Bendire), and Phœnix, February 26, 1897 (Breninger).

Centurus carolinus. RED-BELLIED WOODPECKER.— Accidental at Fort Grant. Ridgway, "Birds of North and Middle America." VI, 1914, 57.

Zonotrichia querula. HARRIS'S SPARROW.— One was taken by M. F. Gilman, March 16, 1913, at Sacaton and identified at the Biological Survey.

Anthus spraguei. SPRAGUE'S PIPIT.— A specimen was collected April 4, 1905, at Fort Lowell and is now in the Thayer collection. It was identified at the Biological Survey.

Regulus satrapa olivaceus. WESTERN GOLDEN-CROWNED KINGLET. — A specimen was taken by C. Birdseye, September 14, 1908, in the White Mountains and is now in the collection of the Biological Survey.

Hylocichla guttata sequoiensis. SIERRA HERMIT THRUSH.— A specimen was taken by Dr. A. K. Fisher May 14, 1892, at Fort Huachuca and is now in the collection of the Biological Survey.

The Swarth list enumerates 362 species for Arizona. The above records add 9 species, or a total of 371 species now known from the state.— WELLS W. COOKE, *Biological Survey, Washington, D. C.*

Birds transporting Food Supplies.— Mr. Chas. T. Ramsden's interesting note[1] on "The Bobolink as a conveyer of mollusca" suggests to me the desirability of drawing attention to two other instances of similar phenomena. Professor G. E. Beyer of Tulane University, who has been a close student of Louisiana birds for many years, has collected numerous Upland Plover (*Bartramia longicauda*) soon after their arrival upon the Gulf Coast, which bore beneath their wings from 20 to 40 small snails of the Genus *Physa*. In reply to a query about this point Professor Beyer, in a letter of August 7, 1911, says: "The peculiar habit which this bird has in concealing the snails among the under wing feathers has been known to me for many years. When first discovered I pointed out this singular fact to several of my hunter friends. The occurrence, however, was so regular and was confirmed so often in after years, that I expected the habit to be generally known. I used to count the number of snails regularly; at one time I found as many as forty-one, oftener between twenty and thirty, never less than ten or twelve. The stomachs of the birds always contain a number of crushed shells of the snails. Furthermore, the finding of these snails is only possible if the birds are obtained shortly after their arrival from the south, the earliest date of which I always placed about March 22. I was at the time unable to determine whether the species of snail was the same or different from ours, for the genus contains several species. At the time the 'Papabottes' arrive here, Physa is not common with us and does not become plentiful until May and June. I am sorry to say that I became as it were side-tracked in after years as I had intended to continue this inquiry and extend it to other migratory birds of a similar nature."

The notes by Professor Beyer and Mr. Ramsden give us the final phase of the phenomenon but they do not show how the snails reached the position in which they were found. The following brief note published by Grace Ellicott of New Castle, Ind., in 'The Guide to Nature'[2] gives an account of the initial stage of a similar occurrence. Miss Ellicott's contribution is as

[1] Auk, XXXI, 1914, p. 250.
[2] Vol. I, No. 5, Aug. 1908, p. 168.

follows: "The occupants of a recently disturbed ant hill were excitedly crawling about the hill and the adjacent cement walk. They were large, and to a Blue Jay in a neighboring tree they must have looked luscious, for flying down, the jay began to pick them up with an eagerness that seemed to say that this was an opportunity that might come his way but once. As rapidly as he could do it he seized the ants, with each capture lifting a wing, sometimes one, sometimes the other, and seemed to deposit his prey among the feathers back of and underneath it. So quickly he worked and with such evident eagerness to make the most of this rare occasion that, as he lifted the wing, putting his bill among the feathers, it often seemed that he must lose his balance and topple over backwards. But he kept his poise, worked on with all speed and had laid in quite a store when a passerby frightened him from his task. Whether this jay had only just discovered the most convenient of all storehouses for his use or whether this food was to be carried to the nest for the young, for it was nesting time, he was most interesting."

This Blue Jay was therefore taking advantage of the instinct of ants when disturbed to fasten their jaws onto any object that presents itself. It must be also that the snails here mentioned have a propensity for clinging to the feathers among which they are placed. These three most interesting observations suggest that numerous birds may have the same or other wonderful habits about which we are ignorant. They should stimulate minute and careful research and comfort those who fear that all the interesting things have already been discovered.— W. L. McAtee, *Biological Survey, Washington, D. C.*

RECENT LITERATURE.

Ridgway's 'The Birds of North and Middle America.' Part VI.[1]— This portly volume carries Mr. Ridgway's great work almost as far as the Falconiformes, the two groups Coccygiformes (Cuckoo-like Birds) and Psittaciformes (Parrots), which intervene having been omitted on account of lack of space, although the former is entirely in type and the latter nearly completed. It will thus be seen that of the 'land birds' Mr. Ridgway has only the Hawks and the Gallinaceous birds to treat of.

The families covered in the present part are treated in the same thorough manner that characterized the earlier volumes. Seven of the twelve do not occur north of Mexico and the West Indies, but the Woodpeckers, Goatsuckers, Owls, and Kingfishers contain many North American species and the volume will thus be of much greater interest to those who do not extend their studies below the southern boundary of the United States, than was its predecessor. The treatment of the Nighthawks and Horned Owls follows the recent monographs of Mr. Harry C. Oberholser, since Mr. Ridgway examined the material with him and coincided with his views. The new forms proposed in this connection have been elsewhere commented upon in these columns. In other groups we note: *Psilopornis* (p. 361), a new genus with *Galbula albirostris* as its type, and the following new subspecies; *Hypnelus ruficollis coloratus* (p. 382), Encontrados, Venezuela; *Otus asio hasbroucki* (p. 694), Palo Pinto Co., Texas; *O. a. brewsteri* (p. 700), Salem, Oregon; *Glaucidium gnoma grinnelli* (p. 791), Humboldt Bay, California; *G. siju vittatum* (p. 805), Isle of Pines; *Micropallas whitneyi sanfordi* (p. 809), Lower California; and *M. w. idoneus* (p. 810), Hidalgo, Texas. A number of changes in the nomenclature of species of the A. O. U. Check-List are noticed. *Dryobates villosus leucomelas* becomes *septentrionalis*, while the subspecies *D. v. leucothorectes, orius, sitkensis, icastus, D. pubescens glacialis, D. scalaris eremicus,* and *cactophilus, Colaptes auratus borealis, Xenopicus albolarvatus gravirostris, Phlœotomus pileatus floridanus*

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[1] **The Birds | of | North and Middle America: | A Descriptive Catalogue | of the | Higher Groups, Genera, Species, and Subspecies of Birds | known to occur in North America, from the | Arctic Lands to the Isthmus of Panama | the West Indies and other Islands | of the Caribbean Sea, and the | Galapagos Archipelago. | By | Robert Ridgway, | Curator, Division of Birds. | Part VI.**

Family Picidæ — The Woodpeckers.
Family Capitonidæ — The Barbets.
Family Ramphastidæ — The Toucans.
Family Bucconidæ — The Puff Birds.
Family Galbulidæ — The Jacamars.
Family Alcedinidæ — The Kingfishers.
Family Todidæ — The Todies.
Family Momotidæ — The Motmots.
Family Caprimulgidæ — The Goatsuckers.
Family Nyctibiidæ — The Potoos.
Family Tytonidæ — The Barn Owls.
Family Bubonidæ — The Eared Owls.

Bulletin of the United States National Museum. No. 50. Washington Govt. Printing Office. April 8, 1914. pp. i–xx+1–882, pll. I–XXXVI.

and *picinus* are recognized. The California Woodpecker and its races are separated generically as *Balanosphyra* Rgdw., while for the Red-cockaded Woodpecker the generic name *Phrenopicus* Bp. is used. The genus *Ceryle* is divided, *Streptoceryle* being used for *C. alcyon* and *torquata*, and *Chloroceryle* for *C. americana* and its allies.

Several races accepted by the A. O. U. Committee are rejected by Mr. Ridgway as *Phalænoptilus nuttallii nitidus* Brewster which he regards as not distinct from *P. nitidus; Cryploglaux acadicus scotæus* Osgood which is considered an individual variation of *C. acadicus*; and *Otus flammeolus idahoensis* Merriam which is referred to *O. flammeolus*.

Melanerpes formicivora of the Check-List appears as subspecies *aculeata* Mearns, true *formicivora* being exclusively Mexican and in the same way *Dryobates scularis bairdi* of the Check-List becomes *D. s. symplectus*. *Otus asio* is considered to apply to the Florida Screech Owl which necessitates the use of *O. a. nævius* (Gm.) for the common eastern form, while *O. xantusi* is made a subspecies of *O. asio*.

The footnotes throughout the volume are full of important bibliographic references and synonymy of extralimital forms, while the generic synonymy in the main text contains numerous names with their types designated which are not to be found in other general works.

'The Birds of North and Middle America' is essentially a technical work and only those who are constantly engaged in general systematic ornithology will really appreciate the enormous amount of labor that the author has expended upon it. Mr. Ridgway richly deserves the congratulations of all ornithologists upon the splendid results that he has already accomplished and their best wishes for his success in the volumes that still remain to be completed.— W. S.

Chapman on New Birds from Colombia, Venezuela and Ecuador.— Dr. Chapman's studies of the rich series of South American birds obtained by the recent expeditions of the American Museum of Natural History are progressing steadily and two publications relating to them have recently appeared. In the first [1] he calls attention to the need of collections from the Bogotá district of Colombia in order to fix the exact type localities of the 200 species that have been described from there, and describes very briefly the itinerary of the expedition which he conducted to Bogotá in 1913 for the purpose of securing the desired material. Some 2300 specimens representing over 500 species were obtained, and 28 forms are here described as new either from this collection or from that of the previous expedition.

A second paper [2] describes the attempt of Mr. Leo E. Miller and Mr. F. X. Iglseder of the American Museum to reach Mt. Duida on the upper Orinoco.

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[1] Diagnoses of apparently new Colombian Birds, II. By Frank M. Chapman. Bull. Amer. Mus. Nat. Hist., XXXIII, Art. XII, pp. 167–192. March 19, 1914.

[2] Descriptions of a new Genus and Species of Birds from Venezuela. By Frank. M. Chapman. do., Art. XIII, pp. 193–197. March 19, 1914.

Unfortunately after about three months' travel, although the base of the mountain was reached, a return had to be made immediately owing to the desperate illness of Mr. Iglseder. A collection of 400 birds was secured on the Upper Orinoco and 600 more at Cristobal Colon, but the avifauna of the mountain still remains unknown. The following new forms are described: *Geotrygon pariæ* (p. 194), Cristobal Colon; *Neomorphus nigrogularis* (p. 194) foot of Mt. Duida; *Nonnula duidæ* (p. 195), foot of Mt. Duida; *Microxenops* (gen. nov.) *milleri* (p. 196), foot of Mt. Duida. The new genus is allied to *Xenops* but with a straight gonys and square tail of ten feathers, not reaching beyond the closed wings. A third contribution[1] contains descriptions of *Leptotila ochraceiventris* (p. 317), Zaruma; *Speotyto cunicularia punensis* (p. 318), Puna Island; *Pyrrhura albipectus* (p. 319), Zamora; *Tityra semifasciata emeraldae* (p. 320), Esmeraldas; and *Pitylus nigriceps* (p. 322), Loja — all in Ecuador. Ornithologists will look forward with great interest to Dr. Chapman's final reports and the generalizations which the vast collections at his disposal and his personal knowledge of the zoögeography of the region will enable him to draw.— W. S.

Mearns on New African Birds.[2]—In this paper Dr. Mearns continues his studies of the recent collections of British East African birds in the U. S. National Museum. The new forms, all of which are members of the *Pycnonotidæ*, are as follows: *Phyllastrephus strepitans fricki* (p. 1), Tana River; *P. cerviniventris lönnbergi* (p. 2), Tharaka District; *P. placidus keniensis* (p. 2), Mt. Kenia; *Chlorocichla flaviventris meruensis* (p. 3), near Mt. Kenia; *Andropadus fricki* (p. 4), base of Endoto Mt.; *A. f. kitungensis* (p. 4), Kitunga; *Stelgidocichla latirostris pallida* (p. 5), Mt. Gargues, 7,100 ft.; and *S. l. saturata* (p. 6), Honi River, base of Mt. Kenia. — W. S.

Thayer and Bangs on Birds of the Arctic Coast of East Siberia.[3]—This paper describes the ornithological results of a trip undertaken by Mr. Johan Koren along the Arctic coast of East Siberia, west to the Kolyma River, made possible by the generosity of Mr. John E. Thayer. The mammals are reported upon by Dr. Glover M. Allen in the same publication.

Mr. Koren's notes are of great importance and as he reached the country before the ice broke up he was able to record the first arrival of the migrants.

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[1] Descriptions of New Birds from Ecuador. By Frank M. Chapman. do., Art. XXIII, pp. 317–322. May 22, 1914.

[2] Descriptions of Eight New African Bulbuls. By Edgar A. Mearns. Smithsonian Misc. Colins, Vol. 61, No. 25. (Publ. 2260) February 16, 1914 [received March 11.] pp. 1–6.

[3] Notes on the Birds and Mammals of the Arctic Coast of East Siberia. Birds. By John E. Thayer and Outram Bangs. Proc. N. Engl. Zoöl. Club. V, pp. 1–48. April 9, 1914.

The authors say "We think no one can read the notes without marveling, as we have done, at one thing — how birds can withstand such a winter climate, where 85 degrees below zero Fahr. is not unusual. And yet there is at the Kolyma a quite varied winter bird fauna." The list contains 109 species or subspecies of which the following are described as new: *Lagopus lagopus koreni* (p. 4) Kolyma; *Squatarola squatarola cynosuræ* (p. 23), Baillie Island, Arctic America, proposed for the American Black-bellied Plover as distinct from that of Europe; *Circus cyaneus cernuus*, (p. 32), Kolyma; *Budytes flavus plexus* (p. 41), Kolyma; *Otocoris alpestris euroa* (p. 43), Kolyma.

The authors protest against being compelled by "existing Laws" of nomenclature to adopt *Xenus* as distinct from *Xenos*. The A. O. U. Code explicitly rules that such words are identical and the statement to the contrary in the International Code is merely a suggestion and not a part of the Code, so that they would seem to be perfectly free to follow their preference in this matter and still have the 'Laws' on their side.

Students of North American birds will be interested to learn from this paper that the Gray-cheeked Thrush is not a mere straggler in Siberia but breeds regularly as far west at least as the Kolyma River.

Altogether Messrs. Thayer and Bangs have presented an exceedingly interesting paper as well as a valuable contribution to the ornithology of a little known region.— W. S.

Stresemann on the Birds of Ceram.[1]— This paper consists of a list of 153 species with full synonymy and extended annotations, covering not only the results of the author's explorations but those of all other ornithologists who had previously visited the island and whose expeditions are treated historically in the preface. The work is characterized by the same careful preparation and accuracy of detail that mark Mr. Stresemann's other publications and forms a valuable monograph of the avifauna of this interesting island. We note the following new forms: *Megapodius duperreyii buruensis* (p. 41), Buru; *Sterna bergii thalassina* (p. 57), Rodriguez; *S. sumatrana mathewsi* (p. 60), Aldabra; *Hemiprocne mystacea confirmata* (p. 110), Ceram; *Dendrobiastes hyperythra negroides* (p. 125), Central Ceram; *Myiagra galeata seranensis*, (p. 127), Central Ceram; *Pachycephala pectoralis alfurorum* (p. 132), Ceram; *Androphilus disturbans musculus* (p. 136), Central Ceram; *Zosterops obstinatus seranensis* (p. 139), Central Ceram; *Z. o. ternatanus* (p. 139), Ternate; *Erythrura trichroa pinaiæ* (p. 147), Central Ceram; *Dicrurus hottentottus manumeten* (p. 148), Ceram. The plates represent scenery, bills of the Hornbill, *Rhyticeros plicatus*, and colored figures of *Oreosterops pinaiæ*, *Stigmatops monticola* and the new *Androphilus*.— W. S.

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[1] Die Vögel von Seran (Ceram) (Aus den zoologischen Ergebnissen der II. Freiburger Molukken-Expedition) Von Erwin Stresemann. Novit. Zool. Vol. XXI, pp. 25–153, tafeln III–V. February, 1914.

Mathews' 'The Birds of Australia.'[1]— Mr. Mathew's great work continues to appear notwithstanding the fact that the author is making a tour of Australia, the results of which we trust will be of benefit to the book, the author and Australian ornithology. The present part completes the Ibises, Spoonbills and Storks and makes good progress with the Herons. We note no new names that have not already been characterized in the author's previous papers and only one point in nomenclature with which we cannot agree. The generic name *Herodias* Boie 1822 is used for the large White Egrets as in the A. O. U. Check-List. We have always held that this name was a synonym of *Egretta* Forster, 1817, in-as-much-as Gray in 1841 designated as its type *Ardea garzetta* L. His subsequent designation of *A. egretta* in 1855 we hold was invalidated by this previous action. The case was submitted to the International Commission on Zoölogical Nomenclature six years ago and an opinion has just been rendered (Op. 62, March, 1914) sustaining our contention. It will thus be necessary to employ *Leucophoyx* for *Ardea egretta* L. and its allies.— W. S.

'Die Schwalbe,' the Austrian Bird Migration Report.[2]— This important publication appears at irregular intervals under the auspices of the Ornithological Section of the Royal Zoological and Botanical Society of Vienna. The present number comprises 'The Question of the Harmfulness of the Dipper (*Cinclus cinclus*) by Dr. L. v. Lorenz; 'Observations and Investigations on the Jay,' by Curt Loos; 'The First Arrival Dates of Various Migrant Birds in the Spring of the Years 1887 [= 1897] to 1903 by Dr. Ludwig v. Lorenz with the coöperation of Dr. Morez Sassi; 'On the Influence of the Weather on the Arrival of Migrant Birds in Spring,' by Dr. A. Defant.

The last two are of particular interest to all students of migration. Dr. Lorenz had at his disposal the records of no less than 442 observers located in an area about equal to that of the state of Arizona. Apparently only the date of first arrival is recorded by each observer and the mere tabulation of these for the thirty species considered, forms an immense mass of records. The graphic representation of these data is ingenious. A map is devoted to each species for each year and the date of arrival at each station is indicated by a colored dot. Red represents an arrival between March 2 and 6; orange, March 7–11; yellow, March 12–16; etc. to blue and violet, in the order of the spectrum. An early year shows a preponderance of red dots while in a later one yellow or green dots will prevail.

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[1] The Birds of Australia. Vol. III, Part 5. Witherby & Co. London, March 26, 1914.

[2] Die Schwalbe. Berichte Komitees für Ornithologische Beobachtungs-Stationen in Österreich. Redigiert von Dr. Ludwig Ritter Lorenz von Liburnau. Neue Folge III, 1902–1913. Herausgegeben von der Ornithologischen Sektion der K. K. Zool.-Bot. Gesellschaft in Wien. pp. 1–157, pll. 9.

Dr. Defant's report on the influence of weather conditions on migration deserves careful study. It is interesting to note that in tabulating the data to show which days are characterized by the greatest number of arrivals he adopts the same plan used by the Delaware Valley Ornithological Club in 'Cassinia,' except that he does not reject the obviously 'late dates.'— W. S.

Grinnell on the Mammals and Birds of the Lower Colorado Valley.[1]— The latest of Dr. Grinnell's studies of California birds and mammals and their distribution has to do with that portion of the Colorado River valley which forms the southeastern boundary of the state. The expedition which furnished most of the data and material for the present report was made possible by the generosity of Miss Annie M. Alexander, founder of the California Museum of Vertebrate Zoölogy. Dr. Grinnell took personal charge of the field work and was assisted by Messrs. Frank Stephens, Joseph Dixon and L. Hollister Jones. The party descended the river by boat from Needles nearly to the Mexican line below Yuma, making twenty-nine stops, and occupying three months' time, from February 15 to May 15, 1910. A collection of 1272 mammals and 1374 birds was secured as well as many other specimens.

To the carefully prepared annotated list are added chapters on the 'Zonal and Faunal Position of the Region'; the 'Associational Areas'; 'The Colorado River as a Highway of Dispersal'; and as a 'Hindrance to Dispersal' and 'The Problem of Barriers with Regard to Birds and Mammals.'

Under these headings Dr. Grinnell continues the discussion of the problems and principles of distribution which has characterized his recent papers. Attention is called to the "two schools of faunistic students," one of which regards temperature as the chief factor in controlling distribution while the other advocates "a composite control, of many factors resulting in ecologic 'associations,'" and the author attempts to bring these views into accord on the theory, which we heartily endorse, that they are due simply to "difference in perspective." He recognizes again zones due to climatic differences; faunas, due to differences in humidity; and associations, due to environmental conditions — both inanimate and animate.

Eleven different associations are recognized — the River, Willow-Cottonwood, Tule, Arrowweed, Quail-brush, Mesquite, Saltbush, Creosote, Catclaw (or Wash), Saguaro, and Encelia (Rocky Hills) — with lists of characteristic birds and mammals. The species are separated into several categories according as whether they are exclusively restricted to the given 'association' or are at their maximum or minor abundance there. The

[1] An account of the Mammals and Birds of the Lower Colorado Valley, with Especial Reference to the Distributional Problems Presented. By Joseph Grinnell. Univ. of Cal. Publ. in Zoology, Vol. 12, No. 4, pp. 51–294, pls. 3–13, 9 text figs. March 20, 1914.

characteristic winter species are included in the lists as well as those that breed. In discussing barriers the author points out that the degree of difference between mammals occurring on the two sides of the Colorado, varies directly as the extent to which the river proves a barrier to their dispersal. He considers that the ranges of all birds and mammals will be accounted for by one or more of the several kinds of barriers which he tabulates, *i. e.* (1) Tangible (mechanical), land to aquatic species or bodies of water to terrestrial; (2) Intangible (non-mechanical); (a) Zonal (temperature), (b) Faunal (humidity), (c) Associational — food supply, breeding places and temporary refuges. He also believes "that only through the agency of barriers is the multiplication of species, in birds and mammals, brought about."

The annotated list includes 150 species or subspecies and is full of original matter relative to the distribution and relationship of races. Some of the most interesting notes are those relating to the tendency to red in place of yellow in the wings and tail of *Colaptes chrysoides* which the author considers is not an evidence of hybridism; also the discussion of *Phalænoptilus*, two forms of which were present, one resident, the other a winter visitant, and the results of his study of *Geothlypis trichas*, which lead to the conclusion that there is no recognizable Pacific coast race *arizela*.

Dr. Grinnell's recent publications set a very high standard, and one which writers of faunal papers would do well to follow. The day when a mere annotated list forms an acceptable contribution to North American ornithology is rapidly passing and an author will soon be required to be versed in the various problems of evolution and capable of using his data in their elucidation.— W. S.

Bangs and Phillips on Birds from Yunnan.[1]— A collection of 1376 bird skins made by a Japanese collector in southern Yunnan has recently been acquired by the Museum of Comparative Zoölogy and a list of the 240 species, with comments, is here presented. The following are described as new: *Niltava sundara denotata* (p. 280), Mengtsze; *Cryptolopha trivirgatus eiuncidus* (p. 282), Mengtsze; *Pericrocotus brevirostris ethologus* (p. 282), Hsienchan, Hupeh, China, W. R. Zappey; *P. b. flavillaceus* (p. 283), Koolloo Valley, northern India; *Spizixus canifrons ingrami* (p. 285), Mengtsze; *Ianthocincla lustrabila* (p. 285), *Loukouchai*; *Pomatorhinus macclellandi odicus* (p. 286), Mengtsze; *P. ruficollis reconditus* (p. 286), Mengtsze; *Actinodura ramsayi yunnanensis* (p. 288). Loukouchai; *Enicurus guttatus bacatus* (p. 292), Loukouchai; *Ianthia practica* (p. 292), Loukouchai; *Buchanga leucogenys cerussata* (p. 302). Ichang, Hupeh, China, W. R. Zappey.— W. S.

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[1] Notes on a Collection of Birds from Yunnan. By Outram Bangs and John C. Phillips. Bull. Mus. Comp. Zoöl., Vol. LVIII, No. 6, April, 1914, pp. 267–302.

Bangs on New Birds.[1]— In several recent papers in the Proceedings of the New England Zoölogical Club Mr. Bangs presents some important contributions to the ornithology of North and Middle America. He finds that the Paroquets which formerly ranged over the interior of the United States from Texas and Illinois to Colorado and the Great Lakes, differ materially from the South Atlantic and Gulf Coast birds in having the yellow paler and the green of a decided bluish tint. This form he names *Conuropsis carolinensis interior* (p. 94), type locality Bald Island, Nebraska.

A new race of *Calocitta, C. formosa pompata* is described (p. 102) in the same publication from Bolson, Costa Rica, and a third race of Scaled Quail is separated (p. 100) as *Callipepla squamata pallida* Brewster from Arizona, etc., true *C. squamata* being restricted to southern Mexico.—W. S.

Oberholser's Monograph of the Nighthawks.[2] — While some orinthologists will not agree with Mr. Oberholser's views as to the amount of subspecific subdivision that is desirable there cannot, we think, be any difference of opinion as to the excellence and thoroughness of treatment that mark this, the latest of his systematic monographs. The thoroughness of the descriptions and technical discussion and the fullness of the synonymy and lists of specimens and localities leave nothing to be desired.

Mr. Oberholser comes to the conclusion that the Nighthawks including the genera *Chordeiles, Nannochordeiles, Nyctiprogne, Laurocalis* and *Podager* represent a family distinct from the Caprimulgidæ which he here names Chordeilidæ. Incidentally he finds differences between the Whip-poor-will and Chuck-wills-widow which seem to him to warrant their generic separation and *Setochalcis* (p. 11) with *Caprimulgus vociferus* Wils. as its type, is proposed for the Whip-poor-wills. Of the genus *Chordeiles*, three species are recognized, *C. rupestris* comprising three subspecies, *C. acutipennis*, with five subspecies and *C. virginiensis* with nine. The new forms are as follows, *C. v. howelli* (p. 57), Lipscomb, Texas, *C. a. micromeris* (p. 100), Xbac, Yucatan, *C. a. inferior* (p. 109), Triunfo, Lower California, *C. r. xyostictus* (p. 116), Bogota, Colombia, and *C. r. zaleucus* (p. 118), Pebas, Peru. Six plates illustrate the palatal structure of *Chordeiles, Caprimulgus, Antrostomus* and *Setochalcis* and the geographic range of the various races of Nighthawks.— W. S.

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[1] An Unnamed Race of the Carolina Paroquet. By Outram Bangs. *Proc. N. E. Zoöl. Club*, IV, pp. 93–94. Nov. 26, 1913.

The Geographic Races of the Scaled Quail. By Outram Bangs. do., pp. 99–100. March 9, 1914.

A New Magpie-Jay from Western Costa Rica. By Outram Bangs. do., pp. 101–102. March 13, 1914.

[2] A Monograph of the Genus Chordeiles Swainson, Type of a New Family of Goatsuckers. By Harry C. Oberholser, of the Biological Survey, United States Department of Agriculture. Bull. 86, U. S. National Museum, pp. 1–123, pll. 1–16

Allen's 'The Red-winged Blackbird.'[1] — Dr. Allen has presented in this monograph one of the best ecologic studies that has yet appeared, one that many other 'ecologists' would do well to take as a model, if they would save this line of research from degenerating into what has been aptly styled an "elaboration of the obvious." The author points out the correlation of the distribution of certain species of birds and other animals with certain environments and certain plant associations, and adds; "What are the adaptations of each species to its peculiar habitat, and how has each become dependent upon it? Questions such as these demand an intimate knowledge, not only of every phase of the life history of each bird, but also of every condition that might be imposed by its surroundings." With this prelude he proceeds to study one species, the Red-winged Blackbird (*Agelaius phœniceus phœniceus*) in a cat-tail marsh near Ithaca, N. Y. The detail and thoroughness of his studies are praiseworthy although, he states, that they form merely an introduction to a true knowledge of the life history of the bird and its relation to its environment.

The environment of the marsh is first considered and the area is divided into seven associations the characteristic plants, birds, mammals, reptiles and amphibians being listed under each. Temperature records for an entire year bring out the rather surprising fact that the average temperatures of the marsh and the adjacent upland differ by less than a degree.

In the study of the Redwing, migration, mating, song, nesting, young, fall migration, enemies, molt and plumage, food and food supply, and correlation of changes in food and stomach structure, and in the reproductive organs are considered. Published data on each subject are briefly quoted, followed by the results of the author's investigations. Incidentally one is impressed with the very little that subsequent writers have added to the accounts of Wilson, and Nuttall bearing upon many of these topics and what an opportunity for original contributions has been neglected. Under migration, Dr. Allen considers the arrival of four categories of birds independent of males and females which are well known to migrate independently. He distinguishes (1) "vagrants" — very early arrivals, representing irregular winter residents from not very far southward, (2) migrant [i. e. transient] adults, (3) resident adults, and (4) resident immatures. The last do not arrive till the "adults" have built their nests and consequently extend the breeding season over a considerable space of time. These facts of migration form another argument against the accuracy of comparisons based upon single first-arrival dates which the writer has emphasized elsewhere.

Dr. Allen's conclusions are that the Redwing is independent of the marsh so far as food is concerned, feeding mainly outside of its limits, that it has taken to nesting in the marsh for the shelter that is afforded

[1] The Red-winged Blackbird: A Study in the Ecology of a Cat-tail Marsh. By Arthur A. Allen. Abstract of Proceedings of the Linnæan Society of New York. Nos. 24–25, 1911–13] pp. 43–128. April 15, 1914.

to it and its offspring. It is generalized in structure and easily adaptable, but has as yet shown no specialization to a marsh environment. He thinks on this latter account that the bird may have only recently deserted the grassland for the marsh and this view is further strengthened by the fact that it reverts readily to nesting in the grassland and deserts the marsh almost as soon as the young are reared. There are many other important points in Dr. Allen's admirable monograph which cannot be touched upon here, but the work is well worthy of the careful perusal of every ornithologist. Twenty-two half-tone plates illustrate the habitats, nests, birds, etc.—W. S.

Beebe's Preliminary Pheasant Studies and Other Papers. — Mr. Beebe presents in a recent paper[1] some of the results of his study of the pheasants preparatory to issuing his monograph of these beautiful birds. The most important point brought out is the possibility of dividing the family into apparently natural subordinate groups according to the method of moult of the tail feathers. In the Perdicinæ the moult begins with the innermost feathers, while in the Phasianinæ it begins with the outermost. In *Polyplectron, Chalcurus, Argusianus* and *Rheinardius* (Argusianinæ of Beebe) it begins with the third pair from the center, and proceeds both ways, while in *Pavo* (Pavoninæ) it begins with the next to the outermost. This character forces *Ithaginis* and *Tragopan* into the Perdicinæ which is quite likely their true position.

In another recent paper[2] Mr. Beebe describes the development and plumage changes of the White Ibises basing his studies on the birds in the large flying cage at the New York Zoölogical Park. In conjunction with Mr. L. S. Crandall[3] he calls attention to the stiffness in the down feathers representing the tail of young ducks and their persistence on the tips of the juvenal rectrices. This condition is particularly noticeable in the Torrent Ducks of the Andes, *Merganetta*. Mr. Beebe has also republished[4] with additions an interesting paper on the 'Effect of a Postponed Moult upon the Sequence of Plumage in Certain Passerine Birds,' which appeared in the American Naturalist for 1908.— W. S.

Chandler on the Feathers of *Circus hudsonius*.[5] — In this paper the author describes in great detail the structure of the feathers of the Marsh

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[1] Preliminary Pheasant Studies. By C. William Beebe, Zoologica, Scientific Contributions of the New York Zoological Society, Vol. I, No. 15, pp. 261–285. April, 1914.

[2] The Ontogeny of the White Ibis. By C. William Beebe, do., No. 12, pp. 241–248. February, 1914.

[3] Specialization of Tail Down in Ducks. By C. William Beebe, and L. S. Crandall, do., No. 13, pp. 249–252. February, 1914.

[4] Effect of Postponed Moult in Certain Passerine Birds. By C. William Beebe, dó., No. 14, pp. 253–258. February, 1914.

[5] Modifications and Adaptations to Function in the Feathers of *Circus hudsonius*. By Asa C. Chandler. Univ. of Cal. Publ. in Zool., Vol. 11, No. 13, pp. 329–376, pls. 16–20. March 21, 1914.

Hawk, a bird selected for study on account of the variety of feather modifications found in its plumage. The down feathers, filoplumes and various contour feathers are considered at length and the obvious adaptations are commented upon, the 'conclusions' are, however, a little disappointing as we find no original results of the investigation. The paper, however, forms a valuable summary of practically all the feather structures found in North American birds and will be a handy reference work on a subject upon which we have but little easily accessible information.— W. S.

Betts' 'Birds of Boulder County, Colorado.'[1] — Colorado ornithology has been receiving much attention during the past few years, but in a state of its size there is room for many local lists, especially if prepared as carefully and printed as attractively as the one before us.

Mr. Betts presents an annotated list of 206 species including records of previous observers to whom due credit is given. Unusual stragglers are printed in their proper systematic position but in italic instead of heavy-faced type, which seems to us a desirable practice. Unfortunately the species are not numbered consecutively, which would have helped materially to separate the paragraphs relating to the different forms, especially where the two styles of type occur. The author adds lists of the species breeding in the several zones while an unpaged supplementary insert gives a summary of the Boulder County birds occurring at various times of year contrasted with similar data for St. Louis County, Mo., taken from Mr. Widmann's 'Birds of Missouri.' An outline map of the county with contour lines appears in the introduction along with brief comments on life zones.— W. S.

Walpole-Bond's 'Field-Studies of Some Rarer British Birds.'[2] — This volume seems to contain a vast amount of original observation upon a number of the rarer birds of England. It consists of eighteen chapters covering the Dartford Warbler, Pied Flycatcher, Crossbill, Cirl Bunting, Chough, Raven, Wood-Lark, "Woodcock" [Short-eared] Owl, Hen Harrier, "Once Common" Buzzard, Eagles, Red Kite, Peregrines, Hobby, Merlin, Gadwall and Black Guillemot. The information set forth will no doubt prove a noteworthy supplement to any general work on British birds, and will be valued accordingly, but the pleasing style in which it is presented makes the volume interesting reading for anyone with an interest in bird life whether he appreciate the rarity of the species and the true ornithological value of the data or not. In this way it appeals to a much wider circle of readers than might be supposed.— W. S.

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[1] Birds of Boulder County, Colorado. By Norman de Witt Betts. The University of Colorado Studies. Vol. X. No. 4, pp. 117–232. December, 1913. Price, 50 cents.

[2] Field Studies of Some | Rarer British Birds | By | John Walpole-Bond | Author of | "The Birds of Bromley (Kent) and its Neighborhood" | "Birds Life in Wild Wales" | and part-author of | "The Book of the Open Air." | Witherby & Co. | 326 High Holborn, London | 1914. 8vo pp. i–ix + 1–305. 7s. 6d. net.

Stresemann on Early Accounts of Birds of Paradise.[1] — This paper consists of a series of extracts from the earliest works on New Guinea which contained accounts of the Paradise birds with comments by the author. There are also reproductions of two curious Italian water colors of the second half of the Sixteenth Century in the possession of the Tring Museum which represent skins of Birds of Paradise.— W. S.

Wright and Allen's Field Note-book of Birds.[2] — This work has the advantage of other similar field note-books in having an outline drawing at the top of each page upon which the colors of the various parts may be written while the bird is under observation, producing a quicker and more accurate result than any written description. Most pages are headed by a typical passerine bird followed by a few pages of woodpeckers, gulls, herons, shore-birds, ducks, and hawks. A schedule for data other than colors is printed below the figure. There are also at the end a list of local migration dates and a number of cross-lined pages for records of daily observations. This seems to be an admirable, note-book for the beginner who has yet to 'learn his birds' and is studying the bird in the bush rather than in the hand.— W. S.

Bryant on the Economic Status of the Western Meadowlark.[3] — After the publication of at least five preliminary papers on this subject, the results of the special investigation undertaken by the State of California are now summarized. The present paper differs chiefly from the bulkier of its predecessors in the larger amount of historical and philosophical matter contained. More attention will be paid to this new matter, therefore, than to that which has previously been reviewed.[4]

The reviewer hopes he may be pardoned for taking a more critical view of this newer, more theoretical material, since his attitude results from no animus, but from a desire to put things in a proper light. The chief effort of Bryant's thesis apparently is to maintain an aspect of originality. Yet he like others with the same ambition, in the end depends mainly on the tried and true. Dissatisfaction with the existing order is expressed in the following paragraph from the preface:

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[1] Was wussten die Schriftsteller des XVI. Jahrhunderts von den Paradiesvogeln? Ein Beitrag zur Geschichte der Ornithologie. Von Erwin Stresemann. Novitates Zoologicæ. XXI. pp. 13–24, pls. 1–2. February, 1914.

[2] Field Note-Book of Birds. By A. H. Wright and A. A. Allen. Dept. of Zoölogy, Cornell University. Including Outlines for the Recording of Observations and Sheets for Preserving a Check-List of the Birds Seen. Ithaca, N. Y. 1913. Price, 50 cents; postage, 4 cents. Corner Book-Stores, Ithaca, N. Y.

[3] Bryant, H. C., A determination of the economic status of the western meadowlark (*Sturnella neglecta*) in California. Univ. of Calif. Publ. in Zoölogy, Vol. 11, No. 14, pp. 377–510, pls. 21–24, 5 text figs. Feb. 27, 1914.

[4] Auk, Vol. XXX, No. 1, Jan., 1913, pp. 132–133, No. 2, April, 1913, pp. 294–295, No. 3, July, 1913, p. 453.

"Considerable difficulty has been experienced in that there has been, and now is, a difference of opinion as to the criteria to be used in the determination of the economic status of a bird. The ideas which have been advanced in the past, and even those of the present day, appear to be unsatisfactory, or at least untrustworthy. It seemed, therefore, that a review of past methods, with the addition of such new ones as appeared to be valuable, might prove not only interesting but of considerable value to future workers in the field. A similar lack of information regarding methods of stomach examination has been evident. A detailed account of the method used in this investigation, therefore, seems justified."

To say the least it is rather odd to pronounce untrustworthy, methods which are used almost without change or improvement in one's own work. It is true some pretence is made in this paper of putting unusual weight on field investigations, periodical weighing of nestlings, determination of time of digestion, etc., but it is noticeable that the largest and most solid part of the paper is based on stomach examination. Previous investigators have used all of these methods, have wrestled with the same problems and have unanimously settled upon the examination of stomachs as the most reliable criterion to the economic value of birds. Bryant comes to the same conclusion on the eightieth page of his paper, saying: "It seemed best to concentrate on the usual method of stomach examination." (p. 456.)

We cannot believe that the ideas advanced in the past, and even those of the present day are so very unsatisfactory, when we see how fully they are adopted and incorporated in Bryant's discussions. The first paragraph in the paper is paraphrased from Biological Survey Bulletin 43, the second paragraph from Bulletin 30, the section on history of methods in Economic Ornithology differs little from that by Weed and Dearborn,[1] and that on a comparison of methods in economic ornithology is largely extracted from a paper[2] by the reviewer. The promised detailed account of the methods of stomach examination is in reality brief, and by no means an improvement on that given by Judd in Biological Survey Bulletin 15, (pp. 12–15).

Notice of originality is served in italics, on page 388, in the following words: "The thing that economic ornithology has not afforded us as yet in a detailed study of the food of a particular bird in a given locality throughout the whole year." Evidently this is what Bryant counts upon as the chief contribution of his paper to economic ornithology. Yet it is precisely what John Gilmour did in 1894–5,[3] for three species of birds, the wood pigeon, rook, and starling, of which he examined 265, 355 and 190 stomachs respectively, which were collected in all months, chiefly on a single estate in Fifeshire, Scotland.

As an economic report, the present paper is marred by the extensive theoretical digressions, but as the previous publications of the State Game

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[1] Birds in their Relations to Man, 1903, pp. 17–26.
[2] Auk, Vol. XXIX, No. 4, Oct., 1912, pp. 449–464.
[3] Trans. Highland and Agr. Soc. Scotland, 1896, pp. 1–93.

Commission and Agricultural Experiment Station, not this, are for popular distribution, little harm is done. There is much to commend in the fresh point of view manifest throughout the report, for instance, the computations of quantity of food consumed. One is that some 340 tons of insects are eaten daily in the breeding season by Western Meadowlarks in the Sacramento and San Joaquin Valleys alone. On pages 461, 487–8 and elsewhere Mr. Bryant points out the importance of availability of food modifying choice; this is the conclusion reached by all investigators, that within its own sphere a bird is most likely to feed on what is abundant or most easily obtained. The remark (p. 469) that: "If birds should become numerous enough actually to control the number of insects, they would doubtless become a greater pest than the insects themselves," is eminently sane and is worthy of the attention of those who would increase birds to the point where they would render insecticides unnecessary.

The statement of the relative merits of parasitic insects and birds (pp. 470–471) is excellent and is here quoted:

"It is readily acknowledged that birds are not the only checks on the increase of insects. The very large toll taken by them, however, places them in the front rank as insect destroyers. Parasites can become abundant only when their host becomes abundant and do their work effectively only after the insect has had sufficient time to cause damage. Birds in order to keep alive must wage a continual warfare on insect life, no matter what the abundance. They are evidently therefore, to be relied upon as more dependable regulators than parasites."

On pages 480–487 is presented a discussion of the question: "Do protective adaptations of insects protect them from the attacks of birds?" This query is brought forcibly to the attention of everyone who examines the stomachs of birds, and the general tendency is to answer it in the negative. Still the problem deserves full consideration, to which Bryant's chapter is a valuable contribution. One point in this section emphasizes the fact that our knowledge of a bird's food is never final. Having even a very large number of stomachs, we may collect one more and find in it items of food unrepresented in any of the others. Bryant found no Coccinellids in the stomachs he examined, and is inclined to take it as an indication that these beetles are "protected." Professor Beal, however, found a Coccinellid (*Hyperaspis dissoluta*) in the stomach of a California Meadowlark and has found others in those of the eastern species. The fact that Coccinellidæ are unusually abundant in California is as apparent from the stomach contents of birds as from any other evidence, a fact which goes far to show that these beetles pay their proportionate toll to the bird world.

In concluding, surprise must be expressed that Mr. Bryant's report makes no reference to Professor F. E. L. Beal's article on "Our Meadow Larks in Relation to Agriculture,"[1] which was written in response to the same situation that brought forth the publication here reviewed.— W. L. M.

[1] Yearbook, U. S. Dept. Agriculture, 1912, (1913), pp. 279–284.

Field Studies of the Food of Nestling Birds.— Four papers[1] by students at the Iowa Lakeside Laboratory, give remarkably detailed accounts of the food of the nestlings of three species of birds.

These papers are selected for discussion not because they are vastly different from other recent articles on their subject, nor because they lack in general merit. The flaw the reviewer would point out is perhaps due to over-enthusiasm on the part of the observers, or perhaps to failure to realize the difficulty of making exact identifications of insects. Nevertheless it is a fault, and a grievous one to publish identifications that could not possibly have been made under the conditions.

As an example the following is quoted from paper No. 3, on the Catbird: "Among the 55 beetles fed were recognized may-beetles, click beetles, tiger beetles, water beetles, and snout beetles of various species. The flies were mostly fish flies, though house and stable flies were noted." (pp. 179–180.) A mosquito also is recorded. Now the positive identification of a mosquito, and the distinguishing of the house and stable flies, two obscurely marked species of the same family require far closer and more definite observation than could possibly be made on specimens in process of being fed to nestling birds. Sixty-five identifications of mosquitos are recorded in paper No. 2 (p. 55). It would be of interest to know how it was decided that these insects were mosquitos rather than midges (*Chironomidæ*), fungus flies (*Mycetophilidæ*) or even small crane flies (*Tipulidæ*), all of which have a strong general similarity.

These are only instances; the food notes throughout are more definite than could reasonably be expected. When a writer says an adult thrasher on one visit to the nest fed 4 May-flies, on another 5, or 7, or 6, we wonder how they could be so accurately counted. The number of ants is sometimes given; it would have been an achievement merely to have recognized that ants were being fed. Wire-worms are often recorded, in spite of the liability of confusion with very similar Tenebrionid larvæ.

Enough of illustrations however, the point is this: it should be recognized that reporting on the food of nestling birds on the basis of field observation is work for accomplished entomologists, not for amateur ornithologists. Even with so experienced men on the job little would be learned in many cases. In this connection it is proper to refer to Weed's report on "The Feeding Habits of the Chipping Sparrow."[2] The observations were made

[1] 1. Gabrielson, Ira N. A study of the home life of the Brown Thrasher, *Toxostoma rufum* (Linn.). Wilson Bulletin, Vol. XXIV, No. 2, June, 1912, pp. 65–94.

2. Bigglestone, Harry C. A study of the nesting behavior of the Yellow Warbler (*Dendroica æstiva æstiva*). Wilson Bulletin, Vol. XXV, No. 2, June, 1913, pp. 49–67.

3. Gabrielson, Ira N., Nest-life of the Catbird, *Dumetella carolinensis* Linn. Wilson Bulletin, Vol. XXV, No. 4, Dec. 1913, pp. 166–187.

4. A further study of the home life of the Brown Thrasher, *Toxostoma rufum* Linn. Proc. Iowa Acad. Sci., Vol. XX, 1913, pp. 299–304.

[2] Bull. 55, N. H. Agr. Exp. Sta., July, 1898, pp. 101–110.

by C. M. Weed and W. F. Fiske, two competent entomologists. The parent sparrows visited the nest about 200 times during the day they were observed. The observers were able to decide in 38 cases that caterpillars were brought, but a definite identification of a food item to the family was made in only one instance, and tentative reference to a species or family in only 10 cases. In the Brown Thrasher paper (No. 1 above), on the other hand, only 92 identifications out of 1260 are less definite than to the order. In other words Weed and Fiske were able to identify to the order or better only 49 insects brought in 200 visits (proportion 1 to 4), while the author of Paper No. 1 so identifies 1168 invertebrates brought during 775 trips (proportion 1.5 to 1).

Professor F. E. L. Beal has watched the feeding of the nestlings of many species of birds and he has rarely been able to distinguish the character of the food given; the reviewer in his more limited field has had the same experience. A great many birds feed by regurgitation and the food is at no time visible. The reviewer has pointed out [1] a good way of getting at the general character of the food of nestlings, that is, by examination of the excrement (it may be collected in small cloth bags tied on the birds). What is needed above all, however, is more careful, more scientific work, and especially more preparation for the work, and finally publication only of absolute certainties.— W. L. M.

Economic Ornithology in Recent Entomological Publications.— Three of this year's publications of the United States Bureau of Entomology, contain notes on the bird enemies of insect pests. The sugar-beet wireworm (*Limonius californicus*) does great damage to sugar beets and lima beans on the Pacific coast. It is one of the click beetles, a group preyed upon by most insectivorous birds. A list of birds, common in the infested fields, and which are likely to feed on the beetles is given, in a publication on this insect [2] in addition to direct proof that the California shrike is an important enemy. About 70 to 80 per cent of the excrement of this species was composed of fragments of *Limonius californicus*.

Another wireworm, erroneously so called, in this instance however, is said to damage the tobacco crop in Virginia at least $800,000 annually. This "wireworm" is the larva of a moth (*Crambus caligniosellus*) of the family Crambidæ. It is stated [3] that:

"Birds are a factor in keeping the tobacco Crambus in check. Two species, the quail (*Colinus virginianus*) and the kingbird (*Tyrannus tyrannus*) were observed by the writer to capture the moths, and others are known to feed freely on moths of this genus. F. M. Webster states that

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[1] Bull. 32, U. S. Biological Survey, 1908, pp. 23–24.

[2] Graf, J. E. A preliminary report on the sugar-beet wireworm. Bull. 123, U. S. Bur. Ent., Feb. 1914, pp. 46–47.

[3] Runner, G. A. The So-called Tobacco Wireworm in Virginia. Bull. 78, U. S. Dept. of Agriculture, May, 1914, pp. 13–14.

the wood pewee (*Myiochanes virens*) was observed to destroy large numbers of *Crambus laqueatellus* at Haw Patch, Ind., and C. H. Fernald observed barn swallows feeding on different species of Crambus in Maine. Meadowlarks frequent weedy fields which harbor the larvæ of Crambus, and as these birds are known to feed on various species of cutworms, they doubtless feed also on the larvæ of the tobacco Crambus."

The third insect pest, to whose bird enemies the Bureau of Entomology draws our attention is the rose aphis (*Macrosiphum rosæ*). Mr. H. M. Russell, the author of a bulletin on this plant louse states[1] that he has observed the California House Finch and the White-crowned Sparrow feeding on the aphides. The latter bird almost cleared a rose bush of the lice in ten minutes, during which time many hundreds must have been eaten.

A Canadian publication may be briefly mentioned here for the sake of correcting an erroneous statement relating to birds as enemies of the chinch bug. The author, Mr. H. F. Hudson, states:[2] "Unlike most of our other insect pests, which, for a time, seem to gain the mastery of a tract of country, the chinch bug enjoys almost practical immunity from attack by birds."

On the contrary the chinch bug has no such immunity; we cannot expect birds to specialize on a single species, but there is no doubt that chinch bugs are taken in their proper proportion to the insect world at large. The following 17 species of birds are known to prey upon the chinch bug: Bobwhite, Prairie Chicken, Redwinged Blackbird, Catbird, Mocking-bird, Brown Thrasher, Meadowlark, House Wren, Tree Swallow, Horned Lark, Arkansas Kingbird, Traill's Flycatcher, Seaside Sparrow, Savannah Sparrow, Song Sparrow, Tree Sparrow, and Barn Swallow.— W. L. M.

Hewitt on 'The protection of birds in and around Ottawa.'[3]— It is a significant proof of the value of bird protection for the Entomologist of a great country like the Dominion of Canada to lend active assistance to the forwarding of the plan described in the present paper. At the suggestion of the author, and with the coöperation of the Ottawa Field Naturalist's Club, two of the larger public reservations near Ottawa have been made bird sanctuaries. They will be abundantly supplied with nest boxes and it is hoped that a great increase in bird population will result.

Dr. Hewitt has had previous experience along this line, having successfully used nest boxes to attract birds to an area where their aid was needed in combating the larch sawfly. This was near Manchester, England. "In the first year (1908), 60 boxes were distributed and 31 per cent were occupied. The number of boxes was increased yearly until in 1911 there

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[1] Bull. 90, U. S. Dept. of Agriculture, May, 1914, p. 10.

[2] Ent. Circular No. 3, Div. of Ent., Canada Dept. of Agriculture, 1914, p. 12.

[3] Hewitt, C. G. The Ottawa Naturalist, Vol. XXVII, No. 12, March, 1914, pp. 161–171, Pls. 21–23.

were 347 boxes of which 66 per cent were occupied. . . . In 1913, 75 per cent of the boxes were occupied."

One cannot believe that our birds are so different from those of Europe that similar success in increasing birds may not be had in this country. Let us at least make the attempt. Dr. Hewitt's paper gives directions for making a cheap form of nest box such as was used in England, and contains a good general statement of the value of birds. The entomologists of England and her colonies are unanimous in giving high rank to birds as enemies of insects.— W. L. M.

Menegaux on Birds as Enemies of Mice.[1] — This is a collation of the results published by Dr. A. K. Fisher, in the United States, Dr. George Rorig in Germany, MM. M. de la Faye and G. de Dumast in France, and by a few other authors. The economic tendencies of various rodents are discussed, as well as methods of destroying the animals. It is asserted that the chief cause of the steady increase of noxious rodents is the destruction of their bird, mammal and serpent enemies.

Details are given of the food of numerous species of birds of prey, especially of those common to the old and new worlds. The conclusion is that birds are an underestimated but indispensable factor in the control of these and other injurious animals.— W. L. M.

A note on 'The Effect of Extent of Distribution on Speciation.'[2] — A paper by Asa C. Chandler, with the title quoted is devoted to an exposition of certain conceptions apparently brought forward as new. Nothing could be more obvious, however than the main thesis of the paper, which is, that wide-ranging orders, families and genera, as a rule contain proportionally more families, genera and species respectively than similar groups of more restricted distribution. I do not wish to comment further on this over-elaboration of a fundamental concept, but desire merely to point out a prior statement and argument of the case. Professor Dean C. Worcester in his "Notes on the distribution of Philippine birds,"[3] says: "that in the Philippines the larger the island and the greater the diversity of its surface, the larger the percentage of genera represented by more than one species, and the larger the average number of species into which they are differentiated." (p. 611.) Earlier versions of the idea undoubtedly can be found.— W. L. M.

Henshaw's 'Birds of Town and Country.'[4] — In 1913 the Biological Survey of the U. S. Department of Agriculture under the direction of the

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[1] Menegaux, A., Les Oiseaux ennemis naturels des souris et des campagnols. Rev. Sci. 52, No. 19, May 9, 1914, pp. 586–593.

[2] Am. Nat., Vol. 48, March, 1914, p. 129–160.

[3] Proc. U. S. Nat. Mus., Vol. 20, pp. 567–625, 1898.

[4] Birds of Town and Country. By Henry W. Henshaw. National Geographic Magazine. May, 1914. pp. 494–531.

chief, Mr. Henry W. Henshaw, issued a pamphlet containing colored pictures from paintings by Louis Agassiz Fuertes of fifty of the common birds of the United States. The supply was almost immediately exhausted and in order to extend the educational influence of the pamphlet the National Geographic Magazine republished it in the issue for June, 1913. The same journal now presents 64 additional colored pictures, also reproduced from Fuertes' paintings illustrating practically all of our familiar birds not included in the earlier publication. The text which accompanies them is again by Mr. Henshaw. The educational value of these publications is enormous and the National Geographic Magazine is to be congratulated upon the good work that it has fostered in making familiar to thousands of people the common wild birds of our country. We understand that a limited number of copies of these two articles as well as some other ornithological papers are to be bound and offered for sale by the publishers of the journal.— W. S.

The Ornithological Journals.[1]

Bird-Lore. Vol. XVI. No. 2. March–April, 1914.

The Electric Current in Bird Photography. By Guy A. Bailey.— Telescopes and electric push bottons, in a window of the house, control cameras mounted at feeding stations 100 to 800 ft. distant. Striking photographs taken by the author's unique methods are shown.

The Song of the Philadelphia Vireo. By Mrs. E. F. Miller.

Impressions of the Voices of Tropical Birds. By Louis Agassiz Fuertes. — The third installment of this valuable contribution deals with Orioles, Flycatchers, Finches and Thrushes, while the fourth in the May–June issue takes up the Ant Thrushes and Woodhewers, birds peculiar to tropical America, and of whose habits we know very little. Both Mr. Fuertes' drawings and descriptions of these species are particularly interesting and instructive.

Some Ways of the Oregon Towhee. By Mrs. Stephen E. Thayer.

North American Sparrows — The Purple Finches — Migration by W. W. Cooke, plumages by F. M. Chapman and color plate by L. A. Fuertes.

Educational Leaflet No. 73 treats of the Whip-poor-will.

Bird-Lore. Vol. XVI. No. 3. May–June, 1914.

The Nighthawk in Connecticut. By L. F. Hall and W. I. Smith.

Migration of N. A. Sparrows.— Genera *Peucæa* and *Amiophila*. Color plate by Fuertes.

A Coöperative Study of Bird Migration.— A call for records of arrival of the Red-wing Blackbird, Robin and Phœbe brought 57 returns which have been carefully tabulated by Mr. Chas. H. Rogers.

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[1] The names of the editor and publisher of each journal will be found in the January number of 'The Auk.'

The educational leaflet is by Frank M. Chapman and deals with the Roseate Spoonbill, Bruce Horsfall supplying the color plate, while the Audubon Society department is particularly full and interesting.

The Condor. Vol. XVI. No. 2. March–April, 1914.

History of a Pair of Pacific Horned Owls. By J. B. Dixon.— Fully illustrated.

Destruction of Birds in California by Fumigation of Trees. By A. B. Howell.— Orange trees are treated at night with hydrocyanic acid gas to kill the black scale. Under 200 fumigated trees 92 dead birds were found the next morning. This would mean 360,000 dead birds per year in the state, which the author considers slightly in excess of the actual number sacrificed. A little care in dislodging roosting birds would prevent the slaughter.

Some Discoveries in the Forest at Fyffe. By Milton S. Ray.— Interesting photographs of young Saw-whet Owls.

Birds of Sitka and Vicinity, Southeastern Alaska. By George Willett.— Annotated list of 152 species.

The Condor. Vol. XVI. No. 3. May–June, 1914.

The Cooper Club Member and Scientific Work. By Harold C. Bryant.— An interesting commentary on the work of the club with the prophesy that future work will be largely along experimental lines in investigation of behavior with continued economic investigation and much less collecting.

Bird Notes from Netarts Bay, Oregon. By Stanley G. Jewett.

A Sadly Neglected Matter. By Alan Brooks.— Recording of the colors of soft parts of birds.

Nesting of the Kittlitz Murrelet. By John E. Thayer.

A Change in Fauna. By Fayre Kenagy — At Boulder, Colo.

The Races of *Branta canadensis*. By Alan Brooks.

The Birds of Teton and Northern Lewis and Clark Counties, Montana. By A. A. Saunders. Annotated list of 182 species.

The Wilson Bulletin. Vol. XXVI. No. 1. March, 1914.

An Intimate Acquaintance with Woodcocks. By Gerald A. Abbott.— An interesting Study of habits with excellent illustrations from photographs.

Pied-billed Grebe Notes. By Ira N. Gabrielson.— Parent covering eggs and feigning injury.

The Roll of the Log-cock or Pileated Woodpecker. By E. W. Vickers.

Winter Conditions in Northern Ohio, Winter of 1913–14. By Lynds Jones.

The Effect on the Birds in the opening of the Park and the Building of the Reservoirs in the Vicinity of Youngstown, Ohio. By George L. Fordyce.— Greatly increased in number.

A Brief History of the Wilson Ornithological Club. By Lynds Jones.

Die Vögel.— Handbuch der Systematischen Ornithologie. Critique by W. F. Henninger.

The Oölogist. Vol. XXXI. No. 3. March 15, 1914.

Possible Nesting of Bachman's Sparrow in Southern [*i. e.* S. W.] Pennsylvania. By S. S. Dickey.— Birds not positively identified.

Eggs of the Black Swift. By John E. Thayer.

A Flight of Pine Grosbeaks [in N. W. Pennsylvania]. By R. B. Simpson.

The Ibis. X Series. Vol. II. No. 2. April, 1914.

Some Notes on the Habits and Distribution of *Paradoxornis heudei* David. By Capt. Hubert Lynes.— An interesting account of this curious denizen of the "reed-forests" of the Yangtze Kiang, China. Mr. Pycraft is engaged in studying the relationship of the genus from spirit specimens secured by Capt. Lynes.

Notes on Birds observed in the Bermuda Islands during the Winter of 1912–1913. By John N. Kennedy.— Annotated list of 23 species among which is *Numenius borealis*, one specimen observed January 20, 1913.

Notes on a Collection of Birds from Sierra Leone. By Major H. J. Kelsall.— An extensive annotated list.

An Ornithological Expedition to the Eastern Canary Islands, II. By David A. Bannerman.— A very fully annotated list and discussion of the relationship of the peculiar subspecies.

Description of a strange New Zealand Wood-Hen. By Gregory M. Mathews and Tom Iredale.— *Gallirallus townsoni* sp. nov. (p. 293), Westport, S. Island, with colored plate.

The Moults and Plumages of the Common Moorhen. By C. H. B. Grant.— This Rail moults all the primaries at once as do the ducks and coot.

Remarks on the Geographical Distribution of the Chiff-chaff and Willow Warbler. By Capt. H. Lynes.

Size in the Avian Order Tubinares. By J. T. Nichols.— Great range in size thought to be due to intra-ordinal competition.

A Flock of Tubinares. By Robt. C. Murphy.— Nine species seen in one photograph.

Obituaries of Major Barrett Hamilton and Dr. Günther.

Bulletin of the British Ornithologists' Club. CXCV. February 27, 1914.

Dr. Ticehurst discussed the several races of the Dunlin and their relationship and the difference between females of the Common and Barrow's Golden-eye.

Mr. Rothschild and Dr. Hartert described the following new birds from the Admiralty Islands, north of German New Guinea. *Ninox meeki* (p. 105), *Ceyx dispar*, *Pitta superba* (p. 106), *Micropsitta meeki*, *Graucalus papuensis ingens* (p. 107), *Edolisoma amboinense admiralitatis*, *Zosterops admiralitatis* (p. 108), *Rhipidura setosa niveiventris* (p. 109) and from Rook Island west of New Britain *Edolisoma a. rooki* (p. 107).

Bulletin of the British Ornithologists' Club. CXCVI. March 31, 1914.

Account of the annual dinner of the Club and the B. O. U. with descriptions of the lantern slide exhibitions.

Bulletin of the British Ornithologists' Club. No. CXCVII. April, 18, 1914.

Mr. E. C. Stuart Baker describes as new *Pomatorhinus haringtoni* (p. 124) from Darjeeling, India, and exhibited a chick of the very rare Eared Pheasant (*Crossoptilon harmani*).

Mr. Ogilvie Grant exhibited an abnormally marked Widgeon (*Mareca penelope*) and discussed the plumage of this and *M. americana*.

British Birds. Vol. VII. No. 10. March 2, 1914.

The Courtship of the Common Gull [*Larus c. canus*]. By Maud D. Haviland.

Notes on the Birds of Wiltshire. By G. B. Hony.

Summary of records of Waxwings during the incursion of last winter (1913–14).

British Birds. Vol. VII. No. 11. April 1, 1914.

A Student of Gulls.— Review of 'Life and Natural History Notes of Ewen Kennedy,' with plates from paintings and photographs of the Greater and Lesser Black-backed Gulls.

On the Crossing of the Bill of the Crossbill. By Miller Christy.— There seem to be as many, "dextral" as "sinistral" bills but much variation in the extent of the crossing. The crossing is confined to the horny sheaths alone, the bony structure showing no sign of torsion.

British Birds. Vol. VII. No. 12. May 1, 1914.

Snipe and Redshank nesting in Sussex. By Col. H. W. Feilden.

Recovery of Marked Birds.

The Avicultural Magazine. Vol. V. No. 5. March, 1914.

Green-winged Doves. By Miss R. Alderson.— With color plate of *Chalcophaps chrysochlora*.

Notes on some Conures of the *Euops* group. By Hon. W. Rothschild.— A new form from unknown locality sold alive as "*C. gundlachi*."

Notes on Tame Serpent Eagles, *Spilornis cheela*. By E. C. Stuart Baker.

Aviculture at the Amsterdam Zoological Gardens. By Graham Renshaw.

The Avicultural Magazine. Vol. V. No. 6. April, 1914.

Egg-laying and Nesting Experiences. By Dr. A. G. Butler.

Aviculture in Paraguay. By Lord Brabourne.— An interesting account of some of the birds of this section of South America.

The Reed Warbler, *Acrocephalus streperus*. By H. D. Astley.— With excellent photographs of birds and nest.

The Avicultural Magazine. Vol. V. No. 7. May, 1914.

Some Hints on Parrot-keeping. By The Marquis of Tavistock.

Bird Notes. Vol. V. No. 3. March, 1914.

Some Punjab River Birds. By H. Whistler.

The Birds of Buena Vista Lake, Southern California. By Wm. S. Baily (concluded from February number).— California ornithologists will find some startling records in this paper, such as Black-winged Stilt (*Himantopus candidus*) and Black-headed Gulls identical with those of England, etc.!

Birds of the Jhelum District. By H. Whistler (continued in April number).

The Emu. Vol. XIII. Part 4. April, 1914.

Field Notes on the Spotless Crake (*Porzana immaculata*). By Miss J. A. Fletcher.— Illustrated.

Notes on the Spotless Crake and Western Ground Parrot. By F. Lawson Whitlock.— Illustrated.

Birds of the Brunnette Downs. By H. G. Barnard.— Annotated list of 88 species. Trinomial names are admitted in this list but the subspecific designation is included in parentheses!

Search for Eggs of Colluricincla Woodwardi. By H. G. Barnard.

A Visit to the Gosford Scrubs. By S. W. Jackson.— Notes on 62 species.

Owlet-Nightjar Nestlings. By Harry Burrell.— Photograph of nest in hollow tree.

The South Australian Ornithologist. Vol. I. Part 2. April, 1914.

Melithreptes gularis loftyi.— Southern Black-chinned Honey-eater. By S. A. White.

Field Notes on Three Species of *Malurus* (Blue Wrens). By A. A. Morgan.

Notes on the Southern Black-headed Minah (*Myzantha melanocephala whitei*. By F. R. Zeitz.

Additions to "A List of the Birds of Australia." By Gregory M. Mathews.— Mr. Mathews' trip to Australia has already yielded four new birds, one of which constitutes a new genus, all from North Queensland: the first from the Pascoe the others from Claudie River. *Tyto galei*, and *Magillivrayornis* (gen. nov.) *claudi* (p. 12); *Ægintha temporalis macgillivrayi* and *Neochmia phæton albiventer* (p. 13).

Some Birds Occurring at the Reedbeds, on the Adelaide Plains, this Summer. By S. A. White.

Note on *Platycercus hæmatogaster* (Gould). By Gregory M. Mathews.— This name seems to have been published first in the second part of Gould's "Birds of Australia and Adjacent Islands" and here applies to the yellow-vented bird. It must therefore be adopted for that species while *Northiella h. zanda* (p. 16), is proposed for *hæmatogaster* auct (nec Gould).

Ornithologische Monatsberichte. Vol. 22. No. 3. March, 1914.

New Species of Birds from Amazonia. By E. Snethlage.

Picumnis buffoni amazonicus (p. 39), St. Antonio da Cachoeira on the Rio Jary; *Conopophaga snethlagæ pallida* (p. 39), Cametá on the Tocantin; *Dysithamnus ardesiacus obidensis* (p. 40), *Thamnomanes purusianus* (p. 40), Porto Alegre on the Rio Purus; *Myrmotherula iheringi* (p. 41), Boim on the Tapajoz; *Hypocnemis poecilonota nigrigula* (p. 42), Boim; *Conopias trivirgata berlepschi* (p. 42), Faro on the Jamunda; *Pachysylvia rubrifrons lutescens* (p. 43), Boim and *Pachysylvia inornata* (p. 43), Cametá.

On the Call-notes, Song, Mating Flight, etc. of certain East African Birds. By L. Schuster.

Three new Iberian forms. By E. P. Tratz.— *Parus cæruleus harterti* (p. 49), Leixoes; *P. cristatus weigoldi* (p. 50), Favaios; *Prunella modularis obscura* (p. 50), Oporto.

Ornithologische Monatsberichte. Vol. 22. No. 4. April, 1914.

Remarks on two new Forms of Linnet from Russian Turkestan. By N. Sarudny and M. Härms.— *Linota brevirostris korejevi* and *L. b. pamerensis* (p. 53).

On Forms of Reed-Tits (*Remiza macronyx*). By N. Sarudny.— *R. m. loudoni* subsp. nov. (p. 58), Lenkoram and River Kumbaschi.

Ornithologische Monatsberichte. Vol. 22. No. 5. May, 1914.

A New Form of Woodpecker. *Dryobates minor transitivus* subsp. nov. By H. Baron Loudon — From Lesden in Livland, where it is a winter visitant (p. 79).

Acanthis hornemanni exilipes and *A. linaria holbœlli* in West Prussia. By L. Dobbrick.

Journal für Ornithologie. Vol. 62. No. 2. April, 1914.

The Phylogeny of the Turdidæ. By Dr. J. Gengler.

The Avifauna of the Southeastern Part of the State of South Australia. By E. Eylmann (concluded).

Contribution to the Migration of Sea Birds. By R. Pæssler.

Our Knowledge of the Descent of Birds. By O. Haase.— From G. Heilmann's paper in 'Dansk Ornith. Forenings Tidsskrift.'

Ornithologische Monatsschrift. Vol. 39. No. 2. February, 1914.

How does the Bird find its way. By E. Günther.

Leaves of an Ornithological Journal in Corsica. By Dr. H. Böker.

The Bird of Prey and the Bird-world. By O. Uttendorfer.— Discussion of 2089 cases of birds killed by Hawks, etc.

Ornithologische Monatsschrift. Vol. 39. No. 3. March, 1914.

Annual Report of the Society for Bird Protection.

Bird Protection and Health Problems. By Dr. H. Helfer.

Color plates of two Birds of Paradise, *Paradisœa guililmi-secundi* and *Ptilhoris alberti*.

Revue Francaise d'Ornithologie. Vol. VI. No. 59. March 7, 1914.

Notes on Birds Observed and Collected in Algeria (continued). By Count Zedlitz.— Concluded in the May number, 145 species listed.

A Visit to the Ornithological Exposition at Liege. By C. Marcot.

The First Capture in France of Ross' Gull (*Rhodostethia rosea*). By M. E. Seguin-Jard.— Adult male secured December 22, 1913, at 'Pointe de la Roche,' coast of Vendée, France.

Revue Francaise d'Ornithologie. Vol. VI. No. 60. April 7, 1914.

List of Birds obtained or Observed at Dahomey. By Dr. G. Bouet.

Song Birds of the Environs of Vendome (continued). By E. Coursimault.— Musical notations.

Revue Française de Ornithologie. Vol. 6. No. 61. May 7, 1914.

The Age of the Quail. By M. d'Aubusson — Discussion of some points of Dr. L. Bureau's paper.

Variations in the Plumage of *Melizophilus provincialis*. By Dr. Deleuil.

Ardea. Vol. III. No. 1. March, 1914.

Migration of Birds in Holland in 1913. By Dr. H. Ekama.

The King Penguins in the Zoölogical Garden at Rotterdam. By J. Büttikofer — With plate.

The Blue-throats of Holland. By Dr. E. D. Van Oort.

Studies of Bird Song from a new Point of View. By H. Stadler and C. Schmitt. (In German.)

Messager Ornithologique. Vol. 3. No. 3. 1912.

Remarks on the Ornithology of Turkestan (continued). By N. A. Sarudny.

List of Birds of the Kjelzer Government. By E. I. Katin.

New Facts on the Geographic Distribution of Birds in Russian Altai and Abakan.

Cecropsis rufula ferghanensis subsp. nov. By S. A. Buturlin (p. 242).

Remarks on *Phænicurus semenowi*. By N. A. Sarudny.

Winter Migration of *Loxia bifasciata* in 1911. By B. Ottow.

On the Flight of Birds Against the Wind. By S. A. Buturlin.

An Ornithological Expedition to Lakes Saissan-noir and Marka-Kul. W. Siberia. By G. I. Poljakow (continued in Vol. 4, No. 3).

Messager Ornithologique. Vol. 3. No. 4. 1912.

The Summer Bird Fauna of the Delta of Amudarja. By L. A. Moltschanow.

Notes on the Ornithology of the Tomsk Government. By H. Johansen.

On Some Birds of the Minsk Government. By A. W. Feduschin.

Cygnus bewicki and *Grus leucogeranus* in Winterquaters in east Transcaucasus. By A. N. Karamsin.

Notes on the Bluethroats (*Cyanecula*) in Turkestan. By N. A. Sarudny.

Messager Ornithologique. Vol. 4. No. 3. 1913.

Notes on the Ornithology of Turkestan (continued). By N. A. Sarudny.

On *Anser albifrons*. By N. H. Smirnow.

A White Scoter (*Oidemia fusca*). By W. E. Uschakow.

On the Molt of *Tinnunculus tinnunculus*. By W. A. Hachlow.

Short Remarks on a New Form of Rosy Finch, *Carpodacus rhodochlamys kotschubeii*. By N. A. Sarudny (p. 165).

Messager Ornithologique. Vol. 4. No. 4. 1913.

Notes on the Ornithology of Turkestan (continued). By N. A. Sarudny.

The Biology of the Dipper (*Cinclus melanogaster*). By S. G. Stecher.—With half-tone illustrations.

Notes on Some Caucassian Birds. By E. W. Scharleman.

On the Distribution of the Marsh Tits in European Russia. By P. P. Suschkin.

My Error in Regard to the Forms of Black-headed Goldfinch and a Correction. By N. A. Sarudny.

Remarks on a New Warbler from Turkestan (*Phylloscopus collybita subsindianus* subsp. nov.). By N. A. Sarudny (p. 269).

Ornithological Publications in Other Journals.

Stanwood, Cordelia J. The Brown Creeper at Home. (Bluebird, Vol. VI, No. 5, February, 1914.)

Hyer, E. A. Grinnell's Water Thrush in Charleston, S. C. (Bull. Charleston Mus., Vol. X, No. 3, March, 1914.)

Chisolm, C. Winter Record for Anhinga in S. Carolina. (do., Vol. X, No. 5, May, 1914.)

Miller, W. DeW. Importation of Birds. (Amer. Mus. Journal, Vol. XIV, No. 2, February, 1914.) — At port of New York.

Baynes, E. H. What One Village is Doing for the Birds. (Amer. Mus. Journal, Vol. XIV, No. 4, April, 1914.) — Meriden, N. H.

Clarke, Wm. Eagle. On Some Migratory Birds Observed at Fair Isle during the Spring and Autumn of 1913. (The Scottish Naturalist, No. 27, March, 1914.)

Brock, S. E. The Display of the Mallard in Relation to Pairing. (The Scottish Naturalist, No. 28, April, 1914.)

Baxter, Evelyn V. and Rintoul, Leonora, J. Bird Notes from the Isle of May in 1913. (The Scottish Naturalist, No. 29, May, 1914.)

Panton, H. Relationships of Species (continued). (The Zoologist, No. 873, March 15, 1914.)

Gurney, J. H. Ornithological Report for Norfolk, 1913. (The Zoologist, No. 875, May 15, 1914).

Grinnell, Joseph. Barriers to Distribution as Regards Birds and Mammals. (American Nat., XLVIII, April, 1914.)

Clark, Austin H. A New Race of the Mandarin Duck from Southern Japan. (Proc. Biol. Soc. Washington, XXVII, May 11, 1914.) — *Aix galericulata brunnescens* (p. 87) from Island of Kiusiu.

Riley, J. H. Note on *Anas cristata* Gmelin. (do., May, 1914.)— New genus *Lophonetta* (p. 100) proposed for it.

Oberholser, H. C. *Poœcetes gramineus confinis* in Louisiana. (do., May, 1914.)

Grinnell, Joseph. A New Red-winged Blackbird from the Great Basin. (do., May, 1914.)— *Agelaius phœniceus nevadensis* (p. 107), from Quinn River Crossing, Humboldt Co., Nevada.

Butler, Jefferson. Notes on the Mortality of the Young of Wild Birds. Under Natural Nesting Conditions and Under Artificial or Protected States. (15th Ann. Rept. Michigan Acad. Sci., 1913.) — Data show great mortality in nesting under natural conditions and apparently a great saving by the installation of nest boxes.

Cotton, J. D. The Birds of Northamptonshire and Neighborhood. (Journ. Northants Nat. Hist. Soc. and Field Club, XVII, No. 133, 1913.)

Pellett, F. C. Nest Boxes for Woodpeckers. (Proc. Iowa Acad. Sci., XX, 1913.)

Berninghansen, F. Helpful and Harmful Iowa Birds. (do.)

Gabrielson, Ira N. A Further Study of the Home Life of the Brown Thrasher, *Toxostoma rufum* Linn. (do.)

Brother Alphonsus. Migration of Our Birds in the Spring of 1913. (Amer. Midland Nat., III, 1914.) — At Notre Dame, Indiana.

Seligmann, C. G. and Shattuck, S. G. Observations made to ascertain whether any Relation subsists between the Seasonal Assumption of the "Eclipse" Plumage in the Mallard (*Anas boschas*) and the function of the

Testicle. (Proc. Zool. Soc. London, 1914, pt. 1.) — Testes spermatogenic only in winter and early spring but the change from activity to inactivity does not correspond in time to plumage change. Eclipse occurs in castrated bird, but absolute permanent castration is difficult.

Coburn, C. A. The Behavior of the Crow, *Corvus americanus* Aud. (Jour. Aniaml Behavior, IV, No. 3. 1914.)

Rennie, John. Egg Coloration in the Cuckoo *Cuculus canorus* and its bearing upon the theory of Cuckoo Subspecies. (Proc. Royal Phys. Soc. Edinburgh, XIX, No. 5, 1914.) — A Study of 300 Cuckoo eggs with nests and sets in which they occurred shows that while a certain Cuckoo appears to have a preference for a certain vicinity its preference for a certain species seems to be only in proportion to the abundance of that species.

Van Oort, E. D. Bird-marking in the Netherlands. III. Recovery of Marked Birds. (Notes from the Leyden Mus., XXXV, pp. 209–223, 1914.)

Kroulikovsky, L. On the Birds of the Southern District of the Vialka Government. (Bull. Soc. Ouralienne des Amis des Sci. Nat., XXII, livr. 2, pp. 1–43, 1913.) — Annotated list of 187 species. (In French and Russian.)

Banjkovski, V. B. Systematic Arrangement of the Russian Representatives of the Genus *Scops*. Sav. (Mitth. Kaukas. Museum. VII, lief 2. pp. 142–162, 1913.) — Text in Russian, resumé in German.

Schouteden, H. List of Birds obtained at Kilo by Mr. Thelie. (Revue Zool. Afric., III, fasc. 2, pp. 260–272.) — Annotated list of 116 species from the Congo region west of Lake Albert. The following are described as new; *Campephaga Thelici* (p. 266), *Chlorophoneus melaniprosopus ituriensis* (p. 267) and *C. multicolor Theliei* (p. 268), all from Kilo.

Precigon, A. Ornithology of Upper Vienna. (La Revue Scient du Limousin, XXII, pp. 137–138, 1914).

Hussey, Tacitus. When Passenger Pigeons Were Plenty. (Forest and Stream, March 14, 1914.)

Anonymus. Some New Facts About Eider Ducks. (do., March 21, 1914.)

Guelf, F. G. Birds in Lake Ontario Region. (do., May 2, 1914.)

Griscom, Ludlow. An Interesting Ornithological Winter Around New York City. (Abstract Proc. Linnæan Society, N. Y., Nos. 24–25, April 15, 1914.) — An annotated list of 97 species observed by members of the Society, during the winter of 1912–13.

Publications Received.— Allen, Arthur A. The Red-winged Blackbird: A Study in the Ecology of a Cat-tail Marsh. (Abst. Proc. Linn. Soc. N. Y., Nos. 24–25, 1911–13, pp. 43–128, pll. 1–22.)

Bangs, Outram. (1) An Unnamed Race of the Carolina Paroquet. (Proc. N. E. Zoöl. Club, IV, pp. 93–94, November 26, 1913.) (2) The Geographic Races of the Scaled Quail. (do., pp. 99–100, March 9, 1914.) (3) A New Magpie-Jay from Western Costa Rica. (do. pp. 101–102, March 13, 1914.)

Bangs, Outram and Phillips, John C. Notes on a Collection of Birds from Yunnan. (Bull. Mus. Comp. Zoöl. LVIII, No. 6, pp. 267–302, April, 1914.)

Bannerman, David A. An Ornithological Expedition to the Eastern Canary Islands — Part II. (Ibis, April, 1914, pp. 228–293.)

Beebe, C. William. (1) The Ontogeny of the White Ibis (Zoologica, Scient. Contrib. N. Y. Zool. Soc., Vol. 1, No. 12, Feb. 1914, pp. 241–248). (2) Effect of Postponed Moult in Certain Passerine Birds (do., No. 14, Feb. 1914, pp. 253–258.) (3) Preliminary Pheasant Studies. (do., No. 15, April, 1914, pp. 261–285.)

Beebe, C. William, and Crandall, L. S. Specialization of Tail Down in Ducks. (do., No. 13, February, 1914, pp. 249–252.)

Betts, Norman DeWitt. Birds of Boulder County, Colorado. (Univ. of Colo. Studies, X, No. 4, December, 1913, pp. 177–232.) Price, 50 cts.

Bond, John Walpole. Field Studies of Some Rarer British Birds. 8vo. pp. i–ix + 1–305. London, Witherby & Co. 1914. 7s. 6d. net.

Bryant, Harold Child. A Determination of the Economic Status of the Western Meadowlark (*Sturnella neglecta*) in California. (Univ. of Cal. Publ. in Zool., 11, No. 14, pp. 377–510, pll. 21–24, 5 text figs. February 27, 1914.

Chandler, Asa C. Modifications and Adaptations to Function in the Feathers of *Circus hudsonius*. (Univ. of Cal. Publ. in Zool., 11, No. 13, pp. 329–376, pls. 16–20. March 21, 1914.)

Chapman, F. M. (1) Diagnosis of apparently new Colombian Birds, II. (Bull. Amer. Mus. Nat. Hist., XXXIII, Art. XII, pp. 167–192, March 19, 1914.) (2) Descriptions of a new Genus and Species of Birds from Venezuela. (do., Art. XIII, pp. 193–197, March 19, 1914.) (3) Descriptions of New Birds from Ecuador. (do., Art. XXIII, pp. 317–322. May 22, 1914.)

Gabrielson, Ira N. (1) A Further Study of the Home Life of the Brown Thrasher — *Toxostoma rufum* Linn. (Proc. Iowa Acad. Sci. 1913, pp. 299–304. (2) Nest Life of the Catbird — *Dumetella carolinensis* Linn. (Wilson Bull., December, 1913, pp. 166–187.)

Grinnell, Joseph. An Account of the Mammals and Birds of the Lower Colorado Valley, with Especial Reference to the Distributional Problems Presented. (Univ. of Cal. Publ. in Zool., 12, No. 4, pp. 51–294, pll. 3–13, 9 text figs. March 20, 1914.)

Gross, Alfred O. Observations on the Yellow-billed Tropic-Bird (*Phaëthon americanus* Grant) at the Bermuda Islands. (Auk, XXIX, No. 1, January, 1912, pp. 49–71, pls. III–XI — now issued under separate cover as Contrib. from the Bermuda Biol. Station for Research.)

Mathews, Gregory M. The Birds of Australia. Vol. III, Part 5. 4°. pp. 381–444, pll. 178–189. London, Witherby & Co. March 26, 1914.

Oberholser, Harry C. A Monograph of the Genus Chordeiles Swainson, Type of a New Family of Goatsuckers. (Bull. 86, U. S. Nat. Mus., pp. i–vi + 1–123, pll. 1–6. April 6, 1914.)

Ridgway, Robert. The Birds of North and Middle America. Part VI, (Bull. 50, U. S. Nat. Mus.) 8vo., pp. i–xx + 1–882, pll. I–XXXVI. April 8, 1914.

Shufeldt, Robert W. (1) A Time with the Owls. (Wilson Bull., March, 1914, pp. 6–12.) (2) The Laboratory of Comparative Pathology of the Zoological Society of Philadelphia. (Pop. Sci. Monthly, May, 1914, pp. 507–513.) (3) Saw-Whets and Pygmy Owls. (Guide to Nature, March, 1914, pp. 323–325.) (4) Care and Exhibition of Animals in Zoölogical Gardens. (do., June, 1914, pp. 13–15.) (5) With Note-book and Camera in the National Zoölogical Garden at Washington. (Photographic Times, April, 1914, pp. 125–132. (6) The Biggest Bird that ever Lived. (Scientific American, March 21, 1914, pp. 248–249.)

Stanwood, Cordelia J. The Brown Creeper at Home. (Bluebird, February, 1914, pp. 115–123.)

Stresemann, Erwin. (1) Was Wussten die Schriftsteller Des XVI. Jahrhunderts von den Paradiesvogeln? Ein Beitrag zur Geschichte der Ornithologie. (Nov. Zool., XXI, pp. 13–24, pll. I–II. February, 1914.) (2) Die Vogel von Seran (Ceram). (Nov. Zool., XXI, pp. 25–153, pll. 3–5.)

Thayer, John E. and Bangs, Outram. Notes on the Birds and Mammals of the Arctic Coast of East Siberia — Birds. (Proc. N. E. Zoöl. Club, V, pp. 1–48. April 9, 1914.)

Wright, A. H. and Allen, A. A. Field Note-book of Birds, Ithaca, N. Y. 1913. Price, 50 cts., postage, 4 cts.

Abstract Proc. Linnæan Society N. Y., Nos. 24–25, 1911–1913, April 15, 1914.

Abstract Proc. Zool. Soc. London, Nos. 128–133, February 17–May 5, 1914.

American Museum Journal, The, XIV, Nos. 2–4, February–April, 1914.

Ardea, III, No. 1, March, 1914.

Avicultural Magazine, (3), V, Nos. 5–8, March–June, 1914.

Bird-Lore, XVI, Nos. 2 and 3, March–April and May–June, 1914.

Blue-Bird, VI, No. 7, April, 1914.

British Birds, VII, Nos. 10, 11, 12, VIII, No. 1, March–June, 1914.

Bulletin British Orn. Club, Nos. CXCV–CXCVIII, February 27, March 31, April 18 and May 28, 1914.

Bulletin Charleston Museum, X, Nos. 2, 3, 4 and 5, February–May, 1914.

Condor, The, XVI, Nos. 2 and 3, March–April, and May–June, 1914.

Current Items of Interest (Prepared by Henry Oldys; published by the Audubon Society, Dist. of Columbia). Nos. 18, 19, 20, 21, July, 1913–April, 1914.

Die Schwalbe. Berichte des Komitees of Ornith. Beobacht. Sta. in Oesterreich. III, 1902–1913.

Emu, The. XIII, Part 4. April, 1914.

Forest and Stream, LXXXII, Nos. 13–24, 1914.

Ibis, The, (10), II, No. 2, April, 1914.

Messager Ornithologique, III, Nos. 3 and 4, 1912, IV, Nos. 3 and 4, 1913.
Oölogist, The, XXXI, Nos. 320 to 323, March–June, 1914.
Oregon Sportsman, The, II, Nos. 4 and 5, April–May, 1914.
Ornithologische Monatsschrift, 38, Nos. 2, 3 and 4. February–April, 1914.
Ottawa Naturalist, The, XXVII, Nos. 11 and 12, February and March, 1914.
Philippine Journal of Science, The, VIII, Sec. D., No. 5, October, 1913.
Proceedings Acad. Nat. Sci. Philadelphia, LXVI, Pt. 1. January–March, 1914.
Revue Française d'Ornithologie, VI, Nos. 59, 60 and 61, March–May, 1914.
Science, N. S., XXXIX, Nos. 1104–1016.
Scottish Naturalist, The, 1914, Nos. 27 to 30, March–June, 1914.
South Australian Ornithologist, The, I, Part 2, April, 1914.
Wilson, Bulletin, The, XXVI, No. 1. March, 1914.
Zoologist, The, (4) XVIII, Nos. 207, 208 and 209, March–May, 1914.

NOTES AND NEWS.

The British Ornithologists' Union has lost two prominent members during the present year, although both gained their reputations in other fields than ornithology.

Albert Charles Ludwig Gotthelf Günther known the world over as a leader in the science of ichthyology and for twenty years (1875–1895) keeper of Zoology in the British Museum died on February 1, 1914 in his eighty-fourth year. Dr. Günther was born in Württemberg, October 30, 1830, but early in life came to England and became associated with the Museum. While his actual contributions to ornithological literature were few, it was through his initiative and support that the 'Catalogue of Birds' was published and that alone deserves the thanks of every systematic ornithologist. He also originated the Zoological Record and personally edited the first six volumes.

Gerald Edwin Hamilton Barrett-Hamilton, widely known as an authority on mammals although author of ornithological papers as well, died on January 17, 1914, on South Georgia Island in the Antarctic, where he had gone as leader of a British government expedition to investigate the whale and seal fisheries of the island. He was born in England, May 18, 1871, and his loss while still in the prime of life is a sad blow to the study to which he was devoted.

In the April number of the American Museum Journal there is published a letter from Colonel Theodore Roosevelt relative to his recent South American expedition. He makes a suggestion that the naturalists who accompanied him be permitted to report on the collections that they made and incidentally touches upon a matter that has no doubt confronted many persons who have had to deal with the literature of natural history and which we think demands the serious attention not only of authors but of institutions which are responsible for the fitting out of expeditions and the publication of their results.

Colonel Roosevelt says: "I want to see their work preserved in a volume and not in a collection of pamphlets. Pamphlets, even scientific pamphlets, are almost as ephemeral as newspapers," and he adds in regard to Hudson's 'Argentine Ornithology,' "It has been of the utmost value to us,.... whereas none of us know of the very existence of the multitude of little pamphlets on Argentine ornithology that were published about the time this work was published. Really the only use that pamphlets serve are as bricks out of which some permanent structure can be made."

Zoologists of course understand the importance of securing as many type specimens as possible to the museum with which they are connected and this as well as the natural desire of the author to describe as many new forms as possible, make it necessary to issue small pamphlets containing brief diagnoses of the new species secured on any expedition. The present day rivalry in the field of exploration moreover, makes it imperative that such publications be issued as rapidly as possible.

The point is however that both the author and the institution responsible for such publications should feel in duty bound to the scientific world to follow up this preliminary work with a comprehensive report on each collection as a whole or upon the results of the entire expedition.

There is apparently an unfortunate feeling on the part of some writers and institutions that having, so to speak, "skimmed off the cream," their responsibilities in the matter are ended. The subsequent student in the same field finds scattered descriptions of new forms but is exasperated by the lack of any general account of the collection as a whole with field notes and other details. What a boon it would be to the ornithologist who is studying the avifauna of Ecuador and upper Amazonia to have a complete report of the Buckley collections, instead of the scattered diagnoses of new species from localities the very position of which it requires hours of search to ascertain.

In North America we still lack a report on the birds and mammals of the recent Mexican Boundary Survey, the Harriman Alaskan Expedition and others. The value and importance of such reports compared to the brief preliminary diagnoses of new species can perhaps be appreciated when we consider the extent of the influence of the zoological reports of the 'Pacific Railroad Surveys,' and the number of persons who are familiar with them, as compared with those who even know of the existence of the preliminary descriptions of new species obtained by the surveys and published in the

'Proceedings' of the Philadelphia Academy. Let us hope that the American institutions responsible for the recent explorations in Africa and South America will see to it that they are commemorated in volumes worthy of the splendid work of the naturalists who accompanied them.

THE work of bird protection goes steadily forward with a constantly increasing majority of the citizens of our country earnestly supporting it. The annual report of the National Association of Audubon Societies and the bimonthly reports in 'Bird-Lore' show the wonderful extension of educational work in the schools, while the splendid work at Meriden, N. H., under the direction of Mr. Ernest Harold Baynes shows what a united community may do in the interests of bird protection, and from hundreds of other towns come inquiries about practical bird boxes and methods of attracting the birds, from persons who had hitherto given them no consideration. Legislative interests center about the National Capital and bird protection won another victory on May 12 when the Senate by a vote of 45 to 17 passed the House appropriation of $50,000 for the enforcement of the Migratory Bird Law.

The opponents of bird protection are by no means idle however, especially Senator Reed of Missouri who opposed the above appropriation as bitterly as he did the Tariff provision, forbidding the importation of bird plumage for millinery.

The question of the constitutionality of the Migratory Bird Law will finally be passed upon by the U. S. Supreme Court as we learn from a circular issued by Mr. Wm. T. Hornaday of the N. Y. Zoological Society, that a decision rendered in the Federal Court of South Dakota, April 18 last upheld its constitutionality while another rendered in the U. S. District Court of Arkansas on May 27 decided that it was unconstitutional. Scores of able lawyers have offered their services in supporting the law before the Supreme Court including Mr. Frederic R. Coudert, one of the most distinguished members of the American bar.

The law in regard to Reedbirds will we understand be changed to allow shooting on the Delaware meadows in Pennsylvania, New Jersey and Delaware during part of the autumn. Unless this bird could be absolutely protected, this seems but logical, since it was hardly fair to permit the shooting in Maryland, Virginia and South Carolina and prohibit it along the Delaware.

The cat as an enemy of birds is receiving well deserved consideration but curiously enough proposed legislation against the felines in Massachusetts has divided the humane organizations. The Fish and Game Protective Association and the Audubon Society are demanding that cats be licensed while the Animal Rescue League and several Cat Societies are opposing such action.

JUST as we go to press we are in receipt of Mr. Harry S. Swarth's 'Distributional List of the Birds of Arizona' published on May 25 as Pacific

Coast Avifauna No. 10. We regret that the delay in distribution compels us to defer a review until the October number of 'The Auk.'

The zoölogical collections which the American Museum of Natural History has received through the generosity of Colonel Roosevelt, from the Roosevelt Expedition to South America, amount to twenty-five hundred birds and four hundred and fifty mammals.

Work was begun by Mr. George K. Cherrie and Leo E. Miller, whom Colonel Roosevelt took with him as representatives of the Museum, in the vicinity of Asuncion, Paraguay, in the early part of November. The next collecting station was in the vicinity of Curumbá. From this point, the expedition proceeded northward through San Luiz de Cáceres to Utiarity and Tapirapoan.

At Utiarity Mr. Anthony Fiala, who had accompanied the expedition as photographer and "chief of commissary," started with Lieutenant Lauriodo Sta. Anna, and six natives, down the Papegaio, Jurena and Tapajoz Rivers to Santarem.

At Tapirapoan, Mr. Miller left the expedition and with Second Lieutenant Joaquim Manuel Vieira de Mello, Euzebio Paulo de Oliveira, and Heinrich Reinish, repesentatives of the Brazilian Government, went down the Gy Paraná and Madeira Rivers to Manaos.

On February 27, the main party, consisting of Colonel Roosevelt, Colonel Rondon, Lieutenant Lyra and Doctor Cajazeira, of the Brazilian Army, Kermit Roosevelt, George K. Cherrie and fifteen canoemen, started on what proved to be a perilous voyage down the hitherto unexplored Rio da Dúvida, which was ascertained to flow into the Madeira. The difficulties of transportation were so great that comparatively few specimens were collected by Mr. Cherrie on this trip. Those which he did obtain, however, proved to be of exceptional interest.

Mr. Miller made an important addition to the collection at Calama, at the junction of the Gy Paraná and Madeira, and also at Manaos, which he reached several weeks in advance of Colonel Roosevelt's party.

Doubleday, Page & Co. have just issued a new edition of their well-known 'Nature Library' printed on thin paper, which makes it possible to condense the whole series into eight handy volumes, without in any way abridging the contents.

BLACK-EYEBROWED ALBATROSS OR 'MOLLYMOKE'
Diomedea melanophrys.